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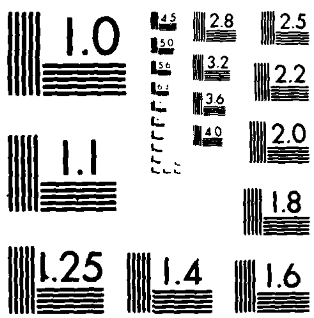

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This report presents the results of the measurement of the drift of buoys during the MARSEN experiment, September and October 1979 and the numerical simulation of sea surface kinematics influenced by waves. The buoy observations were made by tracking the position of the buoys using a radio direction finder. The buoy drogues were deployed at various depths below the surface to study the velocity profile. The numerical model was used to predict wave properties at a sub-wavelength scale equal to that obtained with synthetic aperture radar so that deterministic SAR images could be made.

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MEASUREMENTS OF NEAR SURFACE KINEMATICS UNDER WAVES AND WINDS

by

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Final Report
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CONTENTS

I. INTRODUCTION

This report presents the results of research supporting the development and use of synthetic aperture radar (SAR) as an instrument for making measurement of the coastal environment. The specific objectives of the research reported here were (1) to make ground truth measurements of the near surface drift profile under waves and winds, and (2) to use numerical modeling of shallow water wave fields in the interpretation of SAR images of coastal wave patterns.

The first part of the work, that concerning the near surface profile of drift currents, was conducted as part of the MARSEN field experiment in September and October, 1978. The MARSEN experiment involved extensive remote sensing measurements using a variety of surface and airborn radars.(1) Needed to evaluate the accuracy of radar current measurements were insitu techniques which would describe the vertical profile of currents within a few meters of the sea surface. The research reported herein involved the use of Lagrangran drift buoys with drag localizers placed at depths of from .5 M to 8 M below the sea surface. The buoys emitted a HF signal and were tracked using shore based direction finding (D-F) receivers. Triangulation from two D-F stations allowed the position of the buoys to be tracked over distances of up to 100 km and for time periods of up to 250 hours.

The second part of the research concerned the interpretation of SAR images of nearshore wave fields for which the assumption of wave spectral homogeneity cannot be made; i.e., waves on beaches, waves in the surf zone, and wave diffraction around manmade structures. The interpretation of SAR images of such conditions can be aided with a deterministic, rather than spectral, model for the underlying wave field. A finite

difference deterministic model of near-shore shallow water wave fields was developed. The wave fields generated by the model are spatially inhomogeneous in terms of wave direction, wave height and wave length and describe sea surface height, slope, velocity and acceleration at a resolution equal to that of SAR images. Thus, the interpretation of SAR images of nearshore wave patterns could be augmented with synthetic SAR images.

II. DRIFT UNDER WAVES AND WIND

The subject of this research was the near surface profiles of drift currents under waves and winds. While few field observations have been reported in the literature on this subject, several laboratory studies have been conducted which provide some physical insight into the dynamic processes involved.

Shemdin 1972 presented the results of laboratory measurements of the near-surface drift profile under combined wind and wave action.[2] It was shown that a logarithmic boundary layer is formed near the air-sea interface which increased the phase speed of the surface gravity waves. The drift was found to be 3% of the free stream wind velocity. This drift current increased the minimum wave phase speed by 100%. For a wind of 7.9 m/sec, waves having a frequency between .7 and 1.6 Hz increased their phase speed by .5% to about 10%.

Systematic measurements of drift currents below the air-water interface under various wind conditions were reported by Wu in 1975.[3] Current was found to follow a logarithmic profile near the surface; however, immediately below the surface the current varied linearly with depth. It was found that the surface drift was primarily wind-induced, with Stokes wave drift only a small component. However, this wind component was predicted to decrease in importance with increasing fetch, while the wave-induced Stokes drift would increase. Wave drift would dominate over wind drift for fetches of approximately 1 km and greater.

Csanady 1978,[4] re-analyzing the data presented by Wu 1975, has extended the "law of the wall," familiar from turbulent boundary layer theory, to turbulent drift flow along a sharp density interface. Two

factors determining the boundary layer properties were identified. First, the effective viscosity in the laminar sub-layer is greater than the molecular viscosity of the fluid because of the presence of wavelets at the density interface. These waves contribute to a vertical momentum flux adding to the effect of normal molecular viscosity. For values of u_* (shear velocity) greater than about 1 cm/sec, the formula relating the effective viscosity (Ve) and the molecular viscosity (V) is -

$$\frac{Ve}{V} = 7.3 \left(\frac{u_*^{\,3}}{gV} \right)^{3/2}$$

where g is the acceleration of gravity. Second, the logarithmic (turbulent) boundary layer indicates a rough boundary, whose roughness length scale is a function of the stability of the water column. Increasing stability leads to a reduction in the roughness length scale of the boundary. The effect of stability on the boundary layer above the air-sea interface has been considered for some time (i.e., (5)).

The surface boundary layer formed by the orbital motion associated with surface waves has not been as intensively investigated as for steady drift currents. Several wave theories (linear, Stokes, etc.) can be used to predict the vertical velocity profiles through the main body of the water column. These present theories are only partially successful in agreeing with observations. However, measurements of near surface profiles of surface wave orbital velocities and comparisons with theories are very limited.

In a series of papers, Shonting[(6)(7)(8)] presented the results of field observations of wave particle motions. A ducted-impeller meter was used to measure the Eulerian current at depths from .5m below the wave trough level to near the bottom in 20m of water. There was a

general exponential decay in the wave particle velocities with depth, however differences up to 18% were noted between the observed values and predictions using Stokes 5th order wave theory, linear wave theory and stream function theories. Measurements were made at 10 ft. and 25 ft. depths from the mean water level. Forristall, et. al.,[9] made measurements of storm waves and currents at -13 ft., -23 ft. and -48 ft. below the mean water level. Substantial errors occurred (up to 100%) between predicted values of the orbital velocity measured values.

From this brief review of the literature, it appears that the kinematics of the surface layer are characterized by strong coupling between wind effects, waves, wave induced drift currents and wind induced drift currents. The implication of these studies is that conditions in the ocean will be significantly different from those studied in the laboratory. Major differences include the lack of lateral constraints in the ocean, the possible presence of strong vertical density gradients and the existence of higher and longer waves. Field measurements, to be useful in illucidating the basic processes taking place, would have to be conducted in light of the laboratory results and the predicted time and space scales of the processes, with special attention given to the affects that are unique to the field.

1. Field Procedures

The field site was the area of the North Sea referred to as the German Bight. The MARSEN plan was to combine insitu and remote sensing instruments in a study of coastal oceanographic processes. The drift experiments were planned for various parts of the MARSEN study area.

The measurement of the position of the drift buoys required two stations from which direction cuts could be made. These stations were on Helgoland (Station A) and at the MARSEN headquarters on Sylt at Westerland (Station B). These positions are shown in Figure 1.

The stations were established when the position (longitude and latitude) and the bearing of true North were determined. The coordinates of the stations were 7°52.9'E. Long., 54°11.3'N. Lat. for Station A and 8°18.8' E Long., 54° 55.6' N. Lat. for Station B. The known position of local landmarks and a hand held compass were used to establish the true north bearing. The buoys and direction finding instruments were provided by Telecommunications Enterprises, Panama City, Florida[11]. Prior use of the instruments and the measurement techniques are presented in[12]. The buoys used in the study are shown in Figure 2.

The buoys used in the experiments are listed in Table 1. The buoys are distinguished by their transmitting frequency. Buoys were used for transmission tests, training of observers, double buoy launches and multiple buoy launches.

The buoys were deployed with the drogue located at various depths below the sea surface. Once the buoys were launched at sea, the direction fixes were taken, nominally, at 0900, 1100, 1300, and 1500 each day until reception of the buoy transmission ceased. The buoy measurements are listed in Table 2.

2. Analysis of Data

The locations of the drift buoys were determined using the known positions of the D-F stations and the measured true bearings from Station A and Station B. The variables used in deriving the position of the buoy are given in Figure 3. The target bearings from Station A and B are given as BRA and BRB. The calculation of the target position is based upon applying some relationships involving spherical trigonometry, which are reviewed first.

For the spherical triangle shown in Figure 4, the following relationships hold (13):

Law of Sines

$$\frac{\sin AL}{\sin a} = \frac{\sin BE}{\sin b} = \frac{\sin GA}{\sin c} \tag{1}$$

where AL, BE and GA are angles and a, b, c are arc lengths given in degrees.

Law of Cosines

$$\cos a = \cos b \cos c + \sin b \sin c \cos AL \tag{2}$$

$$\cos b = \cos a \cos c + \sin a \sin c \cos BE \tag{3}$$

$$\cos c = \cos a \cos c + \sin a \sin b \cos GA \tag{4}$$

Half-Angle Formulas

$$\tan \tfrac{1}{2}(ALS-BES) = - \frac{\sin\frac{1}{2}(a-b)}{\sin\frac{1}{2}(a+b)} \tan \tfrac{1}{2}c \tag{5}$$

$$\tan \tfrac{1}{2}(ALS+BES) = - \frac{\cos\frac{1}{2}(a-b)}{\cos\frac{1}{2}(a+b)} \tan \tfrac{1}{2}c \tag{6}$$

$$\tan \tfrac{1}{2}(a-b) = - \frac{\sin\frac{1}{2}(ALS-BES)}{\sin\frac{1}{2}(ALS+BES)} \tan \tfrac{1}{2}c \tag{7}$$

The first step in the data analysis was to compute the arc length separation of the stations and the true bearings of the baseline at each station. The colatitudes of each station (referring to Figure 3) are

$$f = 90° - 54.18833 = 35.81670$$

$$e = 90° - 54.92667 = 35.07333$$

The difference in longitude is

$$DE = 8.31333 - 7.88167 = .43166 \tag{8}$$

and then the supplement

$$DES = 180 - .43166 = 179.56834 \tag{9}$$

Now, using equation (5), for the triangle AB-NORTH POLE in Figure 5,

$$\tan \tfrac{1}{2}(EAS-FAS) = -\frac{\sin \frac{1}{2}(e-f)}{\sin \frac{1}{2}(e+f)} \tan \tfrac{1}{2}CES \tag{10}$$

$$\tan \tfrac{1}{2}(EAS+FAS) = -\frac{\cos \frac{1}{2}(e-f)}{\cos \frac{1}{2}(e+f)} \tan \tfrac{1}{2}CES \tag{11}$$

then with (EAS-FAS) and (EAS+FAS) determined,

$$\tan \tfrac{1}{2}C = -\frac{\sin \frac{1}{2}(EAS-FAS)}{\sin \frac{1}{2}(EAS+FAS)} \tan \tfrac{1}{2}(e-f) \tag{12}$$

so that

$$C = .77968^\circ$$

Using an earth radius of 6369.0 km, the separation between stations was

$$C = 86.67 \text{ km}$$

the true great circle bearings of the stations; GCA and GCB are

$$GCA = 18.5533$$

$$GCB = 198.5533$$

which is found from the formulas

$$GCA = \tan^{-1}(xx) - \tan^{-1}(yy)$$

$$GCB = \tan^{-1}(xx) + \tan^{-1}(yy)$$

where

$$xx = \frac{\cos \frac{1}{2}(LATB - LATA\ \ )}{\tan \frac{1}{2}(LONG\ B - LONG\ A)\ \sin \frac{1}{2}(LATA + LATB)}$$

$$yy = \frac{\sin \frac{1}{2}(LATB - LATA)}{\tan \frac{1}{2}(LONG\ B - LONG\ A)\ \cos \frac{1}{2}(LATA + LATB)}$$

The target position is determined using the known true bearings of the target from Station A and B, namely angles BRA and BRB (See Figure 3). The steps are to first find the interior angles

$$AL = 360^\circ + GCA - BRA$$

$$BE = BRB - GCB$$

Then, the values are found

$$K1 = \sin \tfrac{1}{2}(AL + BE) \cos C$$

$$K2 = \sin \tfrac{1}{2}(AL - BE) \cos C$$

and $zz = \tan^{-1}(K2/K1)$

Then, the angle GA is

$$GA = 2 \cos^{-1}({}^{K1}/\cos y)$$

and the sides a and b are

$$a = \sin^{-1} \left(\frac{\sin AL \sin C}{\sin GA}\right)$$

$$b = \sin^{-1} \left(\frac{\sin BE \sin C}{\sin GA}\right)$$

Then,

$$\cos a'' = \cos e \cos a + \sin e \sin a \cos(2 - BRB)$$

and using this in

$$\sin b'' = \frac{\sin (2 \quad - BRB) \sin a}{\sin a''}$$

Finally, the longitude of the largest is

$$LONG\ T = e - b''$$

and the latitude is

$$LAT\ T = 90 - a''$$

The final step was to compute the separation between the position of the target at two different times T1 and T2, the bearing of the movement and the average speed. The separation and movement bearings are calculated using the functions used to determine station separation and bearing of the baseline. The average speed was calculated from

$$VA = {}^{CX}/T2\text{-}T1$$

where CX is the distance the buoy moved in the time interval T2-T1.

3. Results

The results of the data analyses for selected buoy experiments are presented in Tables 3-6 and Figures 6 and 7. The tables give the position of a buoy, the angle GA of each measurement, and for pairs of measurements the distance between positions (DIS), direction of movement (DIR) and the average speed (SPD). The position of Buoy 396 for the period up to 112 hours after launch is shown in Figure 6.

The buoy experiment shown in Figures 6 and 7 involves 2 buoys (#396 and #397) for which the drogue depth was .5 m and 8 m, respectively. The Tables 4 and 5 indicate that during low wind speed when currents were dominated by tides (hours from 35 to 86) the ratio of the shallow drogue speed to the deep drogue speed varied both above and below the value 1, with an average value of .86. However, during the strong wind period (hours from 133 to 169) the ratio was consistently above 1.0 and averaged 1.75. This trend can be seen in Figure 7, where the shallow buoy 396 position changes are consistently larger than the deeper buoy 397.

The accuracy of the profile measurements depend upon the accuracy of the measurement of buoy position. For a bearing accuracy of 1°, the position accuracy at 50 km is .87 km . Most of the distances between buoy fixes were of the order 10 km , although some separations were as great as 39 km. Thus, the accuracy of the speed measurements were of the order of 10 % . A 10 % error in the speed measurements translates to about a 20 % error in the ratio of the speeds. Therefore the ratio measured for the buoy pair cited above is $.86 \pm .17$ for light winds and $1.75 \pm .35$ for strong winds.

The speed profile of drift under waves and winds has been described for a PM spectrum as decreasing as exp(2kz), where k is the wave number and z is the depth (negative) below the surface (18). For the ratio of speeds between two depths z_1 and z_2, the formula becomes $\exp(k(z_1-z_2))$. For $z_1=-.5$ m and $z_2=-8$ m and a wave frequency of .16 Hz, the predicted ratio is 2.16. The observed ratio under high winds was $1.75 \pm .35$. Therefore the drift measurements tend to support the exponential decay of speed below the surface. Tidal currents, which were ignored in the theoretical formula, would tend to reduce the actual ratio below the theoretical value.

III. SYNTHETIC SAR IMAGES

Synthetic aperture radar (SAR) is now an operational system on Marine Corps reconnaisance aircraft in the form of the Goodyear AN/UPD-4 (14). Many environmental parameters of importance to Naval operations can be sensed by this system. In particular the system is able to image nearshore waves and surf, parameters which are needed to define the environmental conditions of many Naval Inshore Warfare operations. While considerable effort is being devote to develop the capability of SAR to measure deep-water waves, relatively little research is being directed toward the special problems of measuring nearshore waves and surf. The purpose of this study was to develop a method for deterministically analysing SAR images of nearshore waves and surf.

The use of SAR to determine wave properties in deep water is based upon describing the sea surface with a directional spectrum of waves (15,16). Typically an area of the image is Fourier transformed and compared with the ground truth directional wave spectrum. This approach requires that the waves over the area of the portion of the image analysed have a homogeneous two-dimensional spectrum. However wave patterns in shallow water are not homogeneous due to the effects of such processes as refraction, shoaling and attenuation. The approach taken in this study was to develop ground truth for an area in shallow water by constructing the sea surface topography and kinematics using a computer model. This information could then be used , using various radar models, to construct synthetic SAR images which could be compared with the actual images. This approach has the advantage that it can be used around man-made objects and structures which are so prevalent in the coastal areas of the world.

1. Wave Model Approach

All of the classical analytical wave theories have the common limitation of referring to simple geometric situations, i.e., a plane long-crested wave moving over a flat or constant sloping bottom. The general non-linear equations of motion with an arbitrary bottom shape are not soluble analytically. In order to treat the problem of real waves in the detail required to compare with SAR images, we are compelled to introduce discretization of the space ans time dimensions , and solve for the dependent variables at all the necessary points of the four-dimensional space-time grid. This means converting the analytic equations to finite differnce form and solving these numerically.

However, the numerical problem posed by the general finite difference equations is still formidable on account of its spatially three dimensional character. In the case of a homogeneous fluid which is isothermal and incompressible there are four dependent variables: u,v,w,p -- representing the three components of the velocity and the pressure, and the water level . These must be calculated for every time step which over a grid of say 100 by 100 points , will require excessive computer storage and computational time.

A possible way out of these difficulties is to use the general characteristics of the vertical variation in the dependent variables and integrate the equations of motion from the bottom to the surface. This removes one of the spatial variables from the problem.

2. Derivation of the Vertically Integrated Equations for the General Wave Problem

The three-dimensional, ensemble-averaged equations of motion for a homogeneous, incompressible fluid, with turbulent stresses on vertical planes and molecular viscous stresses neglected, can be written

$$\frac{\partial u}{\partial x} + \frac{\partial v}{\partial y} + \frac{\partial w}{\partial z} = 0$$

$$\frac{\partial u}{\partial t} + \frac{\partial u^2}{\partial x} + \frac{\partial uv}{\partial y} + \frac{\partial uw}{\partial z} - 2\Omega_z v = \frac{-1}{\rho}\frac{\partial p}{\partial x} - \frac{1}{\rho}\frac{\partial \tau_{xz}}{\partial z} \qquad (1)$$

$$\frac{\partial v}{\partial t} \quad \frac{\partial vu}{\partial x} + \frac{\partial v^2}{\partial y} + \frac{\partial vw}{\partial z} + 2\Omega_z u = \frac{-1}{\rho}\frac{\partial p}{\partial y} - \frac{1}{\rho}\frac{\partial \tau_{yz}}{\partial z}$$

$$\frac{\partial w}{\partial t} + \frac{\partial wu}{\partial x} + \frac{\partial wv}{\partial y} + \frac{\partial w^2}{\partial z} + 2(\Omega_x v - \Omega_y u) = -\frac{1}{\rho}\frac{\partial p}{\partial z} - g - \frac{1}{\rho}\frac{\partial \tau_{zz}}{\partial z}$$

where Ω is the earth's angular velocity vector, τ_{xz}, τ_{yz}, τ_{zz} are turbulent stress components on the horizontal plane in the directions x, y, z, respectively, g is the acceleration due to gravity; and other symbols have been defined. The Coriolis components of acceleration have been simplified by omission of terms involving w, on the assumption that $w << u, v$.

We eliminate the third momentum equation at the outset by adopting the pressure distribution from small amplitude, frictionless wave theory (see, for example Ippen (1966)):

$$p = -g\rho z + \frac{g\rho \cosh[k(h + z)]}{\cosh[kh]} \cdot \zeta \qquad (2)$$

In the derivation of equation (2) the surface boundary condition was applied not at the actual surface $z = \zeta$, but at $z = 0$. Consequently, the equation has validity only from $z = -h$ to $z = 0$. For positive z one must assume a hydrostatic pressure distribution. Figure 8 illustrates the definitions of z, h and ζ.

Write $$\psi(z) = \frac{\cosh[k(h + z)]}{\cosh[kh]} \qquad -h \leq z \leq 0 \tag{3}$$

ψ has been termed the "pressure response factor". From equations (2) and (3)

$$\frac{1}{\rho}\frac{\partial p}{\partial x} = g\psi\frac{\partial \zeta}{\partial x}\,,\ \frac{1}{\rho}\frac{\partial p}{\partial y} = g\psi\frac{\partial \zeta}{\partial y}$$

With the last two relations, and replacing $2\Omega_z$ by the Coriolis parameter f, the equations to be solved become

$$\begin{aligned}
&\frac{\partial u}{\partial x} + \frac{\partial v}{\partial y} + \frac{\partial w}{\partial z} \\
&\frac{\partial u}{\partial t} + \frac{\partial u^2}{\partial x} + \frac{\partial uv}{\partial y} + \frac{\partial uw}{\partial z} - fv = -g\psi\frac{\partial \zeta}{\partial x} - \frac{1}{\rho}\frac{\partial \tau_{xz}}{\partial z} \\
&\frac{\partial v}{\partial t} + \frac{\partial vu}{\partial x} + \frac{\partial v^2}{\partial y} + \frac{\partial vw}{\partial z} + fu = -g\psi\frac{\partial \zeta}{\partial y} - \frac{1}{\rho}\frac{\partial \tau_{yz}}{\partial z}
\end{aligned} \tag{4}$$

Equations (4) must be integrated over z between the limits $-h$ and ζ. Consider firstly the integration of ψ. Here, in accordance with the previous remarks, the upper limit must be changed to $z = 0$. The error will not be serious if the small amplitude condition: $|\zeta| << h$, holds. From equation (3)

$$\int_{-h}^{0} \psi\, dz = \frac{1}{k}\tanh[kh] \tag{5}$$

Now, another result of the linear, or small amplitude theory is that

$$\sigma^2 = gk\tanh[kh] \tag{6}$$

where σ is the angular frequency of the wave, a constant. Eliminating tanh [kh] from equation (5) using equation (6), we then obtain approximately

$$\int_{-h}^{\zeta} g\psi\frac{\partial \zeta}{\partial x}\, dz = \frac{\sigma^2}{k^2}\frac{\partial \zeta}{\partial x} \tag{7}$$

By definition of the phase speed, S

$$\frac{\sigma^2}{k^2} = S^2 \tag{8}$$

For long waves, when $\psi = 1$ is a good approximation, the right hand side of equation (7) is replaced by

$$g(\zeta + h)\frac{\partial\zeta}{\partial x}$$

Boundary conditions that must be employed in the vertical integrations are:

$$\frac{\partial\zeta}{\partial t} + u\frac{\partial\zeta}{\partial x} + v\frac{\partial\zeta}{\partial y} = w \qquad z = \zeta \tag{9}$$

$$\frac{\partial h}{\partial t} + u\frac{\partial h}{\partial x} + v\,\frac{\partial h}{\partial y} = -w \qquad z = -h \tag{10}$$

Using Leibnitz's Rule with conditions (9) and (10) and relations of type (7), we vertically integrate equations (4) between the limits $z = -h$ and $z = \zeta$ to yield

$$\begin{aligned}
&\frac{\partial\zeta}{\partial t} + \frac{\partial}{\partial x}\int_{-h}^{\zeta} u\,dz + \frac{\partial}{\partial y}\int_{-h}^{\zeta} v\,dz = 0 \\
&\frac{\partial}{\partial t}\int_{-h}^{\zeta} u\,dz + \frac{\partial}{\partial x}\int_{-h}^{\zeta} u^2 dz + \frac{\partial}{\partial y}\int_{-h}^{\zeta} uv\,dz - f\int_{-h}^{\zeta} v\,dz = \frac{-\sigma^2}{k^2}\frac{\partial\zeta}{\partial x} + \frac{\tau_x^s - \tau_x^b}{\rho} \\
&\frac{\partial}{\partial t}\int_{-h}^{\zeta} v\,dz + \frac{\partial}{\partial x}\int_{-h}^{\zeta} vu\,dz + \frac{\partial}{\partial y}\int_{-h}^{\zeta} v^2 dz + f\int_{-h}^{\zeta} u\,dz = \frac{-\sigma^2}{k^2}\frac{\partial\zeta}{\partial y} + \frac{\tau_y^s - \tau_y^b}{\rho}
\end{aligned} \tag{11}$$

τ_x^s and τ_x^b are the x-components of the surface and bottom stresses, respectively. Similarly with the y-components.

We now follow Leendertse (17) , in writing

$$\begin{aligned} u &= U(1 + \varepsilon_u) \\ v &= V(1 + \varepsilon_v) \end{aligned} \tag{12}$$

where

$$U = \frac{1}{h + \zeta} \int_{-h}^{\zeta} u dz \ , \qquad V = \frac{1}{h + \zeta} \int_{-h}^{\zeta} v dz \tag{13}$$

Thus U (x, y) and V (x, y) are the vertically averaged values of u (x, y, z) and v (x, y, z), respectively; and ε_u (x, y, z) and ε_v(x, y, z) express the fractional deviations of u and v from U and V, respectively, at x, y, z.

Define the total height of the water column

$$H = h + \zeta$$

Then, using equations (12) and (13), the left hand sides of equations (11) become

$$\frac{\partial \zeta}{\partial t} + \frac{\partial HU}{\partial x} + \frac{\partial HV}{\partial y}$$

$$\frac{\partial HU}{\partial t} + \frac{\partial}{\partial x} \{U^2(H + \int_{-h}^{\zeta} \varepsilon_u^2 \, dz)\} + \frac{\partial}{\partial y} \{UV(H + \int_{-h}^{\zeta} \varepsilon_u \, \varepsilon_v dz)\} - fHV$$

$$\frac{\partial HV}{\partial t} + \frac{\partial}{\partial x} \{VU(H + \int_{-h}^{\zeta} \varepsilon_u \varepsilon_v dz)\} + \frac{\partial}{\partial y} \{V^2(H + \int_{-h}^{\zeta} \varepsilon_v^2 dz)\} + fHU$$

Assume isotropy of the horizontal velocity stratification. That is

$$\varepsilon_u \ (x, y, z) = \varepsilon_v (x, y, z) = \varepsilon(x, y, z) \tag{14}$$

and let

$$H + \int_{-h}^{\zeta} \varepsilon^2 dz = \alpha H \tag{15}$$

α(x, y, t) may be termed the "local velocity stratification factor" at time t. Always

$$\alpha \geq 1$$

With assumption (14) and definition (15), and after some reduction,

the equations governing the flow become

$$\frac{\partial\zeta}{\partial t} + \frac{\partial HU}{\partial x} + \frac{\partial HV}{\partial y} = 0$$

$$\frac{\partial U}{\partial t} + \alpha U \frac{\partial U}{\partial x} + \alpha V \frac{\partial U}{\partial y} - fV = \frac{-\sigma^2}{k^2 H}\frac{\partial\zeta}{\partial x} + \frac{\tau_x^s - \tau_x^b}{\rho H} - \{U^2 \frac{\partial\alpha}{\partial x} + UV \frac{\partial\alpha}{\partial y} + \frac{U}{H}(1 - \alpha \frac{\partial\zeta}{\partial t}\} \tag{16}$$

$$\frac{\partial V}{\partial t} + \alpha U \frac{\partial V}{\partial x} + \alpha V \frac{\partial V}{\partial y} + fU = \frac{-\sigma^2}{k^2 H}\frac{\partial\zeta}{\partial y} + \frac{\tau_y^s - \tau_y^b}{\rho H} - \{VU \frac{\partial\alpha}{\partial x} + V^2 \frac{\partial\alpha}{\partial y} + \frac{V}{H}(1 - \alpha)\frac{\partial\zeta}{\partial t}\}$$

If in equations (16) we put $\alpha = 1$ and replace σ^2/k^2H by g, we obtain the Ha nsen long wave equations. From (6) we see that the second replacement amounts to the equality

$$\tanh[kh] = kH$$

This will be closely approached for shallow water (or long) waves provided $|\zeta| \ll h$.

3. Evaluation of the Velocity Stratification Factor

It is desired to evaluate α in closed form, using the results of linear wave theory.

On the same level of approximation as equation (2)

$$u = \frac{gk}{\sigma}\frac{\cosh[k(h + z)]}{\cosh[kh]} \cdot \zeta \qquad -h \leq z \leq 0 \tag{17}$$

From equations (3), (5) and (17) we have

$$\int_{-h}^{0} u dz = \frac{g\zeta}{\sigma}\tanh[kh]$$

Hence, approximately, by definition (13) and the last result

$$U = \frac{g\zeta \tanh[kh]}{\sigma H} \tag{18}$$

and therefore, approximately

$$\zeta = \frac{U\sigma H}{g\tanh[kh]}$$

Substituting the last approximation for ζ in (17) yields

$$u = UkH\frac{\cosh[k(h + z)]}{\sinh[kh]}$$

whence, comparing with the first of equations (12)

$$1 + \varepsilon = kH \frac{\cosh[k(h+z)]}{\sinh[kh]} \qquad (19)$$

Now, by definition of ε, we have

$$\int_{-h}^{\zeta} (1+\varepsilon)^2 \, dz = H + \int_{-h}^{\zeta} \varepsilon^2 \, dz$$

Hence, from equations (15), (19), and the last result

$$\alpha H = \int_{-h}^{\zeta} k^2 H^2 \frac{\cosh^2[k(h+z)]}{\sinh^2[kh]} \, dz$$

from which

$$\alpha = \frac{1}{2} \frac{(kH)^2}{(\sinh[kh])^2} \left(1 + \frac{\sinh[2kH]}{2\,kH}\right)$$

It will be desirable, for computational reasons, that α should be a function of position only. To remove the time dependency of α, we substitute h for H in the last result, and so obtain

$$\alpha = \frac{1}{2} \frac{(kh)^2}{(\sinh[kh])^2} \left(1 + \frac{\sinh[2kh]}{2\,kh}\right) \qquad (20)$$

Equation (20) again only holds with the small amplitude assumption.

Some computed values of α between the asymptotic limits 1 and kh/2 are shown in Table 8.

Table 8
Some Computed Values of α

	kh	α
Long Waves	0	1
(Shallow water)	0.3	1.00
Intermediate	1	1.02
Waves	2	1.18
	3	1.53

It appears that the Hansen equations are adequate well into the "intermediate wave" zone, and should yield fair accuracy for wavelengths as short as 3h.

4. The Two-Dimensional Numerical Model

Prior to the present study a two-dimensional, vertically-averaged, long wave computer model had been developed by McHugh (18), utilizing

a mixed implicit-explicit method of solving the finite-difference equations derived from Leendertse (1967). The discretization was that shown in Figure 9.

A full account of the genesis of the model, which was designed to accomodate stretching of the grid lines and a time-varying land/water boundary, is given in McHugh (1976). The model was subsequently modified to allow randomly spaced grid lines, and this is the form utilized in the present work.

In order to generalize the long wave model to simulate waves of arbitrary length, it was merely necessary to insert into the momentum equations the factors α and the correction terms in braces as shown in equations (16); also to replace g in the pressure driving terms by $\sigma^2/k^2H = S^2/H$.

The bottom stress was represented through the Chèzy coefficient, $C(x,y,t)$. Thus:

$$\tau_x^b = \frac{\rho g U(U^2 + V^2)^{1/2}}{C^2}, \quad \tau_y^b = \frac{\rho g V(U^2 + V^2)^{1/2}}{C^2}$$

C values were computed from Manning's formula:

$$C = \frac{1.486\ H^{1/6}}{n} \qquad (H \text{ in ft})$$

The resultant finite difference equations, which are very involved, have been presented as Appendix 1. Referring to this appendix, the superscript n (1, 2, 3...) denotes the time level $n\Delta t$. Barred quantities with subscript u or v denote two-point interpolated values at the positions of U or V indicated. Quantities $V^*_{i,j}$ and $U^*_{i,j}$ denote four-point interpolations of V and U, respectively, centered at the locations of $U_{i,j}$ and $V_{i,j}$. All of these interpolations take into account the possible non-uniform grid spacing.

The quantities I'_i, J'_j etc. are multipliers for determining derivatives when the grid spacing is irregular or stretched. In equation A(i) for instance, for irregular spacing:

$$I'_{i+1/2} = \frac{1}{x_{i+1} - x_i}$$

The notation derives from the form when $I = I(x)$ and $J = J(y)$ are stretching functions such that

$$\frac{\partial}{\partial x} = \frac{\partial}{\partial I}\frac{dI}{dx}, \quad \frac{\partial}{\partial y} = \frac{\partial}{\partial J}\frac{dJ}{dy}$$

or, in finite difference operator form, writing I' for dI/dx and J' for dJ/dy

$$\frac{\Delta}{\Delta x} = \frac{\Delta}{\Delta I} I', \quad \frac{\Delta}{\Delta y} = \frac{\Delta}{\Delta J} J'$$

Lower case subscripts have been used in the equations for convenience.

Quantities $S_{i,j}$ and $\alpha_{i,j}$ were calculated at the centers of the corresponding grid squares. Two sorts of derivatives of α were used: those centered on the ζ-points, and those centered on the U and V-points. The latter are distinguished by additional subscripts u or v in the manner already discussed. Thus for example

$$\alpha_{x i,j} = \frac{\alpha_{i+1,j} - \alpha_{i-1,j}}{1/2(x_{i+2} + x_{i+1} - x_i - x_{i-1}}$$

$$\bar{\alpha}_{xu i,j} = \frac{\alpha_{i,j} - \alpha_{i-1,j}}{1/2(x_{i+1} - x_{i-1})}$$

with analogous expressions for $\alpha_{y\,i,j}$ and $\bar{\alpha}_{yv\,i,j}$.

For the constant boundary model, k(x, y), S (x, y), and α(x, y) are calculated once and for all time over the entire wet field from equations (6), (8) and (20), respectively. Newton's iterative method was found adequate for extracting k from equation (6). The first guess of k was the deep water value, k_o, given as input to the computer program. When the wet boundary changes with time (as for instance on a beach) there is the necessity of defining S and α in the newly flooded region. The strategy in the present study was to assume a default value $\alpha = 1$, and a default value $S^2/H = g$ in the initially dry regions ($h \leq 0$).

The implicit-explicit, double sweep solution technique has been described by Leendertse (1967) and McHugh (1976). Its principal stages are: (i) Solve implicitly for ζ^{n+1} and U^{n+1} along each grid row. (ii) Solve explicitly for V^{n+1} in each square of the wet field. (iii) Solve implicitly for ζ^{n+2} and V^{n+2} along each grid column. (iv) Solve explicitly for U^{n+2} in each square of the wet field. Repeat the procedure for the next pair of time steps, and so on. If the land/water boundary varies in time, this must be established periodically--eg., every two time steps--and allowance made for volume transport into previously dry areas (see Appendix 2).

A principle of the computation is to ignore derivatives when they cannot be computed from the central-difference formula owing to the proximity of a land boundary. This is found (Leendertse (1967)) to be beneficial for numerical stability.

Finally, the necessary boundary conditions required on a row or column are either the water level ζ, or the input/output velocity U or V at all times. At a land boundary $U = V = 0$.

At the start of the model it is customary to assume $\zeta = 0$, and $U = V = 0$ everywhere inside the wet field.

5. Simulation for Rona Rock

The numerical model was applied to a nearshore area on the leeward side of Rona Rock, a small island imaged using the ERIM SAR. The image was taken of waves approaching the island whose height was 5.5 m and whose deepwater wavelength was 211 m (R. Schuchman , personal communication). The leeward side of the island was modeled using the bathymetry shown in Figure 10. The wave period was taken to be 11.6 sec. The grid spacing used in the model was 25 m which for a grid of 120 grid spaces means that the model grid covers an area 3 km square. Because of the

importance of several wave kinematic parameters to the SAR imaging mechanism, several variables were computed at each grid point. These parameters were; sea surface elevation, horizontal wave orbital speed in the x and y directions, the sea surface slope in the x and y directions and the horizontal acceleration and vertical acceleration. The input wave was assumed to be long crested in deep water.

6. Results

The results of the computation are given in Appendix 3. As an example of the output from the model the sea surface elevations are shown in Figure 11. The Figure shows elevations above mean sea level as dark grid points. The refraction/diffraction patttern of the waves in the lee of the island can be seen. If the SAR images were solely a function of sea surface topography, then the SAR image would be directly comparable to the model output.

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V. TABLES

TABLE 1. BUOY RECORD

Buoy Number	Drag Depth (M)	Buoy Frequency (KHZ)	Launch[1] Time/Date	Launch[2] Position
389	4	4146.5	0615/8 Oct.	7.3167E, 54.9167N
391	4	4130.0	0615/8 Oct.	7.3167E, 54.9167N
392	2	4229.4		Test Buoy
393	2	4152.9		Test Buoy
394	3	4193.3		Test Buoy
395	8	4234.0	0615/8 Oct.	7.3167E, 54.9167N
396	.5	4183.7	1905/26 Sept.	7.5035E, 54.4975N
397	8	4217.7	1905/26 Sept.	7.5035E, 54.4975N
398	4	4222.8	0900/22 Sept.	7.7500E, 54.7500W
399	1	4117.0	0900/22 Sept.	7.7500E, 54.7500W
400	1	4100.4	0900/22 Sept.	7.7500E, 54.7500N
401	2	4288.5	0900/4 Oct.	7.1833E, 54.6833N
402	2	4187.6	0615/8 Oct.	7.3167E, 54.9167N
403	2	4286.6	0615/8 Oct.	7.3167E, 54.9167N
408	5.3	4174.1		Test Buoy
409	3	4280.2	0900/22 Sept.	7.7500E, 54.7500N

[1] Time is local experiment time, which was European Standard Time.

[2] Launch position given in degrees of east longitude and north latitude. Values given in degrees and decimal; i.e., 7°30' = 7.5000°

TABLE 2. BUOY MEASUREMENTS

DATE

	September													October													
Buoy No.	18	19	20	21	22	23	24	25	26	27	28	29	30	1	2	3	4	5	6	7	8	9	10	11	12	13	14
392	X																										
393	X																										
394						X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X					
399						X																					
400						X																					
408						X	X	X	X	X	X	X	X	X	X	X	X	X	X								
396									X	X	X	X	X	X	X	X	X	X									
397									X	X	X	X	X	X	X	X	X	X	X	X	X	X	X				
398																	X	X	X	X	X		X				
401																	X	X	X	X	X		X	X			
395																					X	X	X	X			
403																					X	X	X	X	X		
389																					X	X	X				
391																					X	X					
402																					X						

TABLE 3. RESULTS OF OBSERVATIONS FOR BUOY 394

(Drogue Depth 3M)

Hours from Launch	Position Long., Lat.	GA	DIS (KM)	DIR	SPD (CM/S)
14.25	7.9559,54.787	128			
			4.46	222	145.7
15.1	7.9093,54.7576	127			
			1.11	279	30.92
16.1	7.8920,54.7593	125			
			5.61	350	6.74
39.2	7.8772,54.8090	115			
			3.50	174	4.88
59.1	7.8225,54.8089	109			
			2.93	174	35.4
61.4	7.8271,54.7826	114			
			2.03	64	33.3
63.1	7.8556,54.7906	115			
			7.78	359	10.8
83.2	7.8537,54.8606	102			
			7.24	255	105.8
85.1	7.7442,54.8440	97			
			7.47	55	98.8
87.2	7.8398,54.8824	97			

TABLE 4. RESULTS OF OBSERVATIONS FOR BUOY 396
(Drogue Depth .5M)

Hours from Launch	Position Long., Lat.	GA	DIS (KM)	DIR	SPD (CM/S)
11.6	7.5810,54.4440	104			
			9.45	151	107.2
14.2	7.6519,54.3702	108			
			4.34	345	6.0
34.2	7.6348,54.4080	109			
			4.16	324	55.0
36.3	7.5973,54.4385	106			
			5.96	137	85.0
38.2	7.6597,54.3990	112			
			3.78	124	48.9
40.4	7.7083,54.3802	119			
			10.27	319	15.9
58.4	7.6042,54.4501	107			
			2.35	236	32.6
60.35	7.5740,54.4382	103			
			2.40	23	36.1
62.2	7.5886,54.4580	105			
			3.71	164	554.3
64.1	7.6046,54.426	106			
			4.67	305	6.3
84.2	7.5453,54.4501	100			
			7.34	122	47.0
88.45	7.6408,54.4166	110			
			7.10	2.5	11.2
106.1	7.6457,54.4780	113			
			1.85	333	22.4
108.3	7.6332,54.4934	112			
			8.40	330	55.6
112.5	7.5680,54.5590	104			
			14.9	332	21.0
132.3	7.4592,54.6772	90			
			3.76	341	52.2
134.2	7.4406,54.7093	87			
			4.39	167	61.1
136.2	7.4557,54.6707	90			
			15.06	352	21.1
156	7.4255,54.8051	80			
			11.06	285	76.8
160	7.2587,54.8311	69.5			
			9.67	39	14.9
178	7.3541,54.8986	69.5			

TABLE 5. RESULTS OF OBSERVATIONS FOR BUOY 397
(Drogue Depth 8M)

Hours from Launch	Position Long., Lat.	GA	DIS (KM)	DIR	SPD (CM/S)
10.2	7.5911,54.4497	105			
			6.86	157	48.9
14.1	7.6328,54.3930	108			
			1.39	83	20.4
16.0	7.6541,54.3945	111			
			7.51	327	11.6
34.0	7.5907,54.4511	105			
			.51	192	7.1
36.0	7.5890,54.4466	105			
			4.09	131	56.8
38.0	7.6364,54.4223	110			
			5.14	147	71.3
40.0	7.6792,54.3834	114			
			8.25	320	12.7
58.0	7.5980,54.4407	106			
			4.23	211	58.7
60	7.5641,54.4081	100			
			6.28	13	87.3
62	7.5864,54.4631	105			
			3.62	142	50.3
64	7.6203,54.4372	109			
			8.19	295	11.4
84	7.5056,54.4689	96			
			8.17	121	56.7
88	7.6132,54.4304	107			
			10.49	11	14.6
108	7.6450,54.5229	113			
			6.11	305	84.9
110	7.5676,54.5548	104			
			20.17	339	25.5
132	7.4573,54.7247	87			
			3.37	274	46.9
134	7.4047,54.7269	84			
			2.28	25	31.7
136	7.4195,54.7455	84			
			9.47	321	13.1
156	7.3270,54.8120	74			
			4.47	42	31.1
160	7.3736,54.8419	74			
			5.98	328	9.2
178	7.3240,54.8876	69			
			4.04	220	56.2
180	7.2832,54.8598	69			

TABLE 5 Continued

Hours from Launch	Position Long., Lat.	GA	DIS (KM)	DIR	SPD (CM/S)
			19.3	327	24.3
202	7.1176,55.0048	55			
			39.15	334	22.6
250	6.8530,55.3230	37			
			15.07	311	139.56
253	6.6714,55.4111	33			

TABLE 6. RESULTS OF OBSERVATIONS FOR BUOY 408
(Drogue Depth 5.3M)

Hours from Launch	Position Long., Lat.	GA	DIS (KM)	DIR	SPD (CM/S)
14.2	7.8609,54.7259	126			
			3.06	43	85.1
15.2	7.8937,54.7458	127			
			4.07	12	118.6
16.3	7.9085,54.7872	122			
			4.52	6	7.01
34.2	7.9157,54.8276	115			
			5.03	226	34.1
38.3	7.8590,54.7962	115			
			3.73	314	4.9
59.3	7.8174,54.8198	107			
			2.09	163	27.6
61.4	7.8270,54.8018	111			
			2.62	150	38.3
63.3	7.8471,54.7814	116			
			9.94	17	13.8
83.2	7.8946,54.8666	104			
			7.57	251	105.2
85.2	7.7824,54.8445	100			
			10.09	63	127.4
87.4	7.9224,54.8862	102			

TABLE 7. COMPARISON OF DRIFT SPEEDS

Hours from Launch	Speeds (CM/S) 396	397	Ratio of Speeds 396/397
35	55	7.1	7.7
37	85	56.8	1.5
39	48.9	71.3	.68
49	15.9	12.7	1.25
59	32.6	58.7	.56
61	36.1	87.3	.41
63	54.3	50.3	1.08
74	6.3	11.4	.55
86	47.0	56.7	.83
133	52.2	46.9	1.11
135	61.1	31.7	1.93
146	21.1	13.1	1.61
158	76.8	31.1	2.47
169	14.9	9.2	1.62

VI. FIGURES

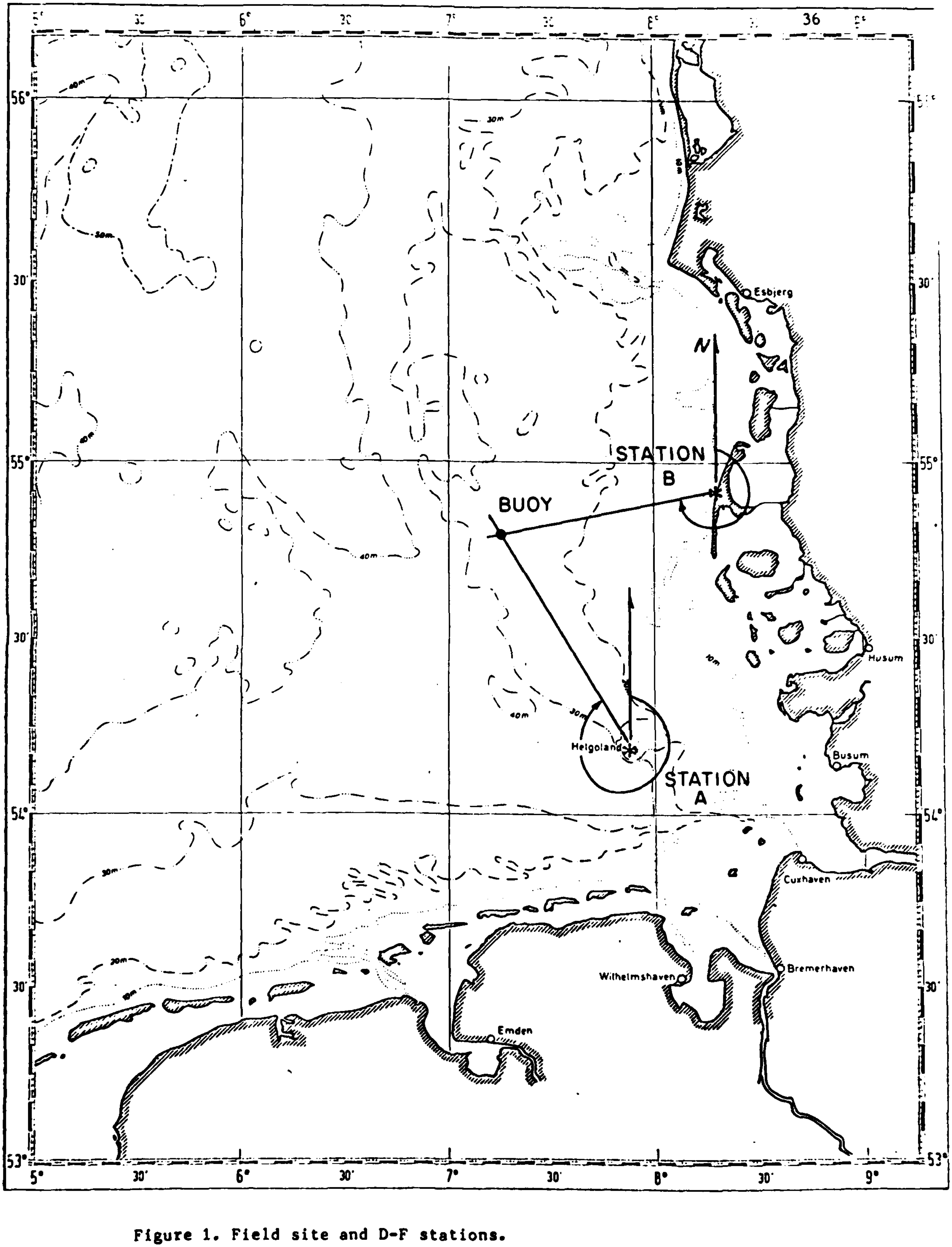

Figure 1. Field site and D-F stations.

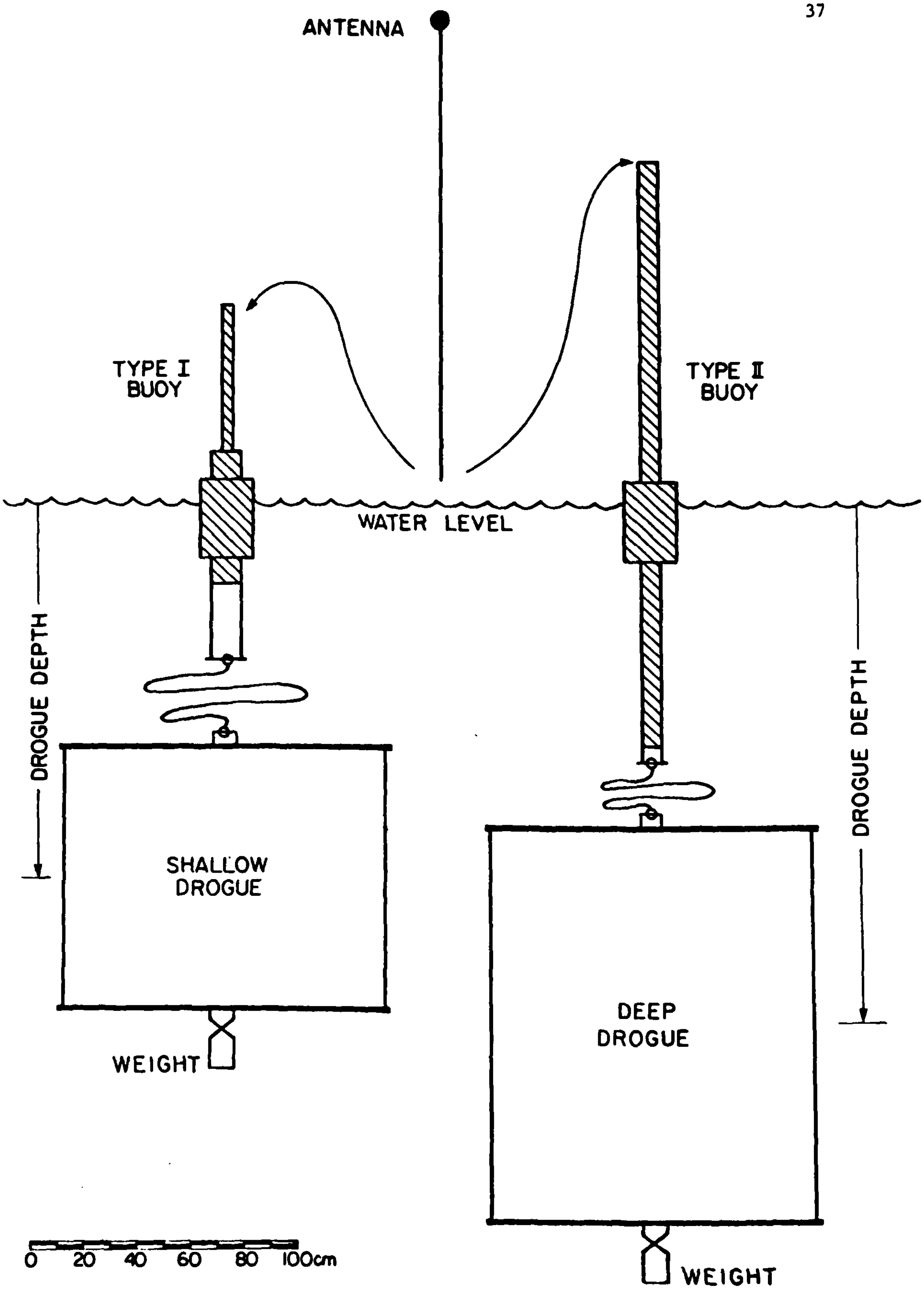

Figure 2. Buoy types used in the experiments.

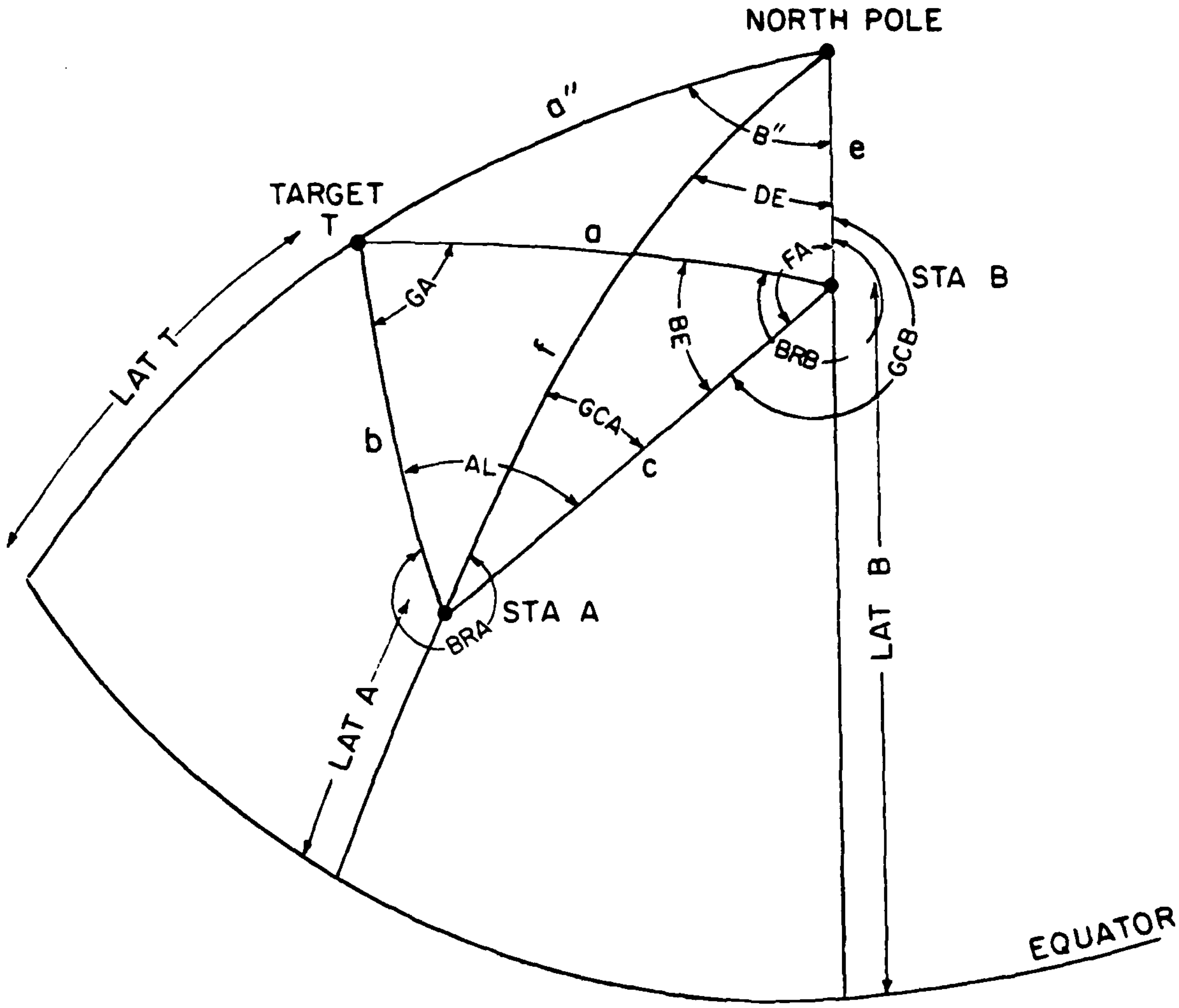

Figure 3. Variables used in computing the location of the target buoys from the bearings at each station.

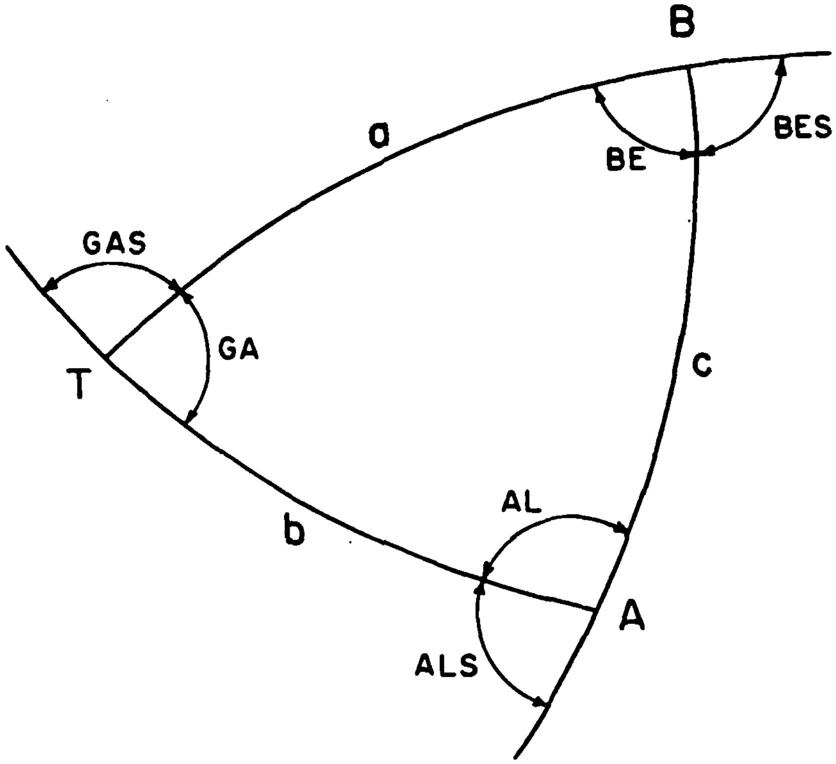

Figure 4. Spherical triangle with interior angles, their supplements and their opposite sides defined.

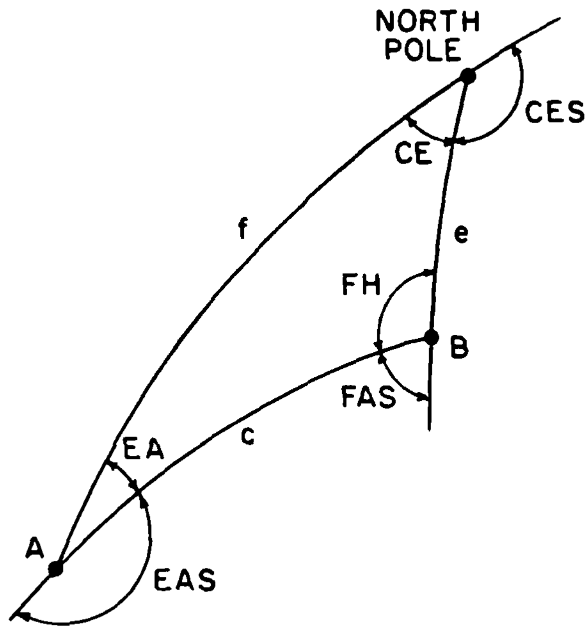

Figure 5. North pole spherical triangle used to compute station separation.

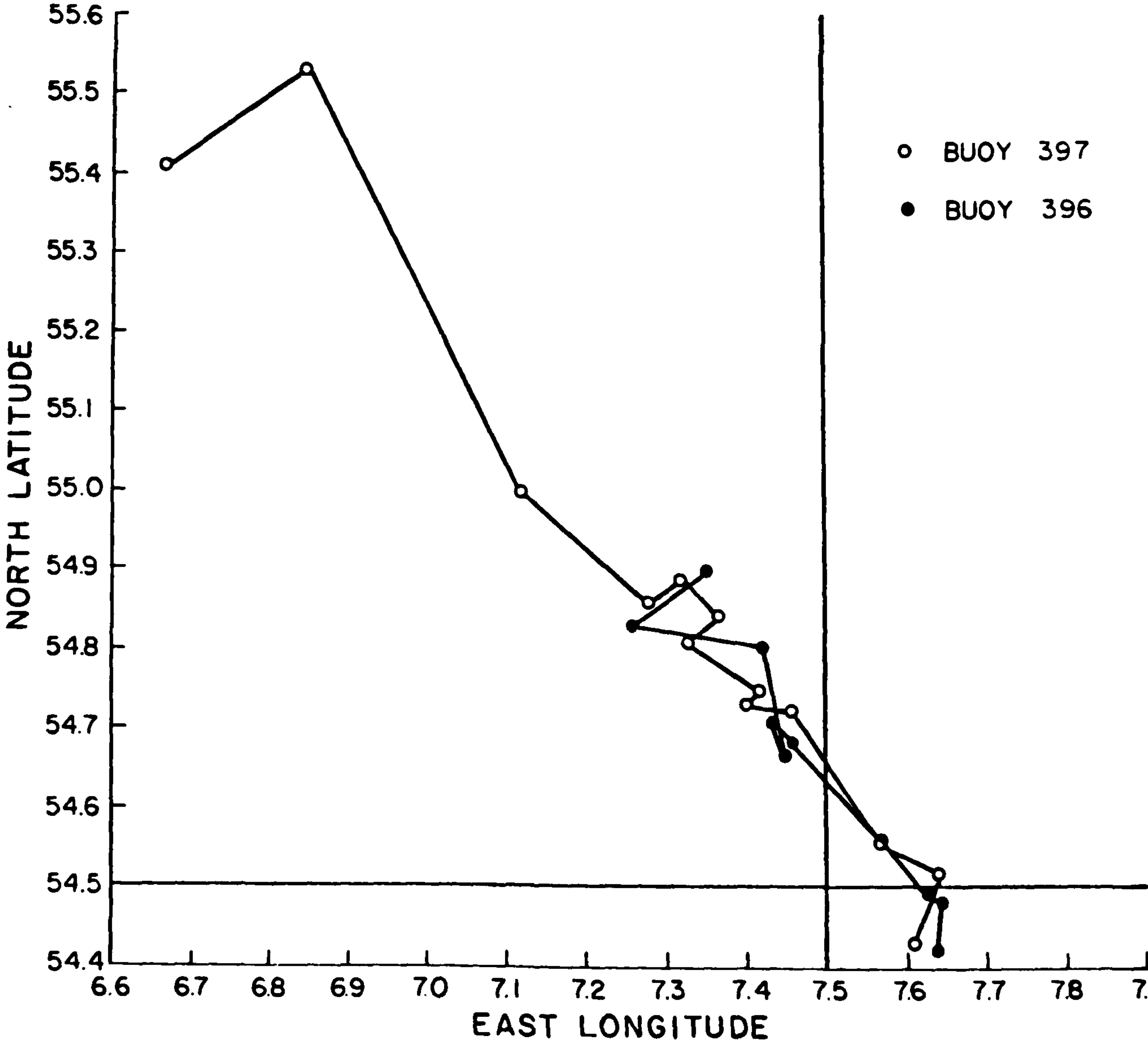

Figure 6. Positions of buoys #396 and #397 for various times of measurements given in Tables 4 and 5.

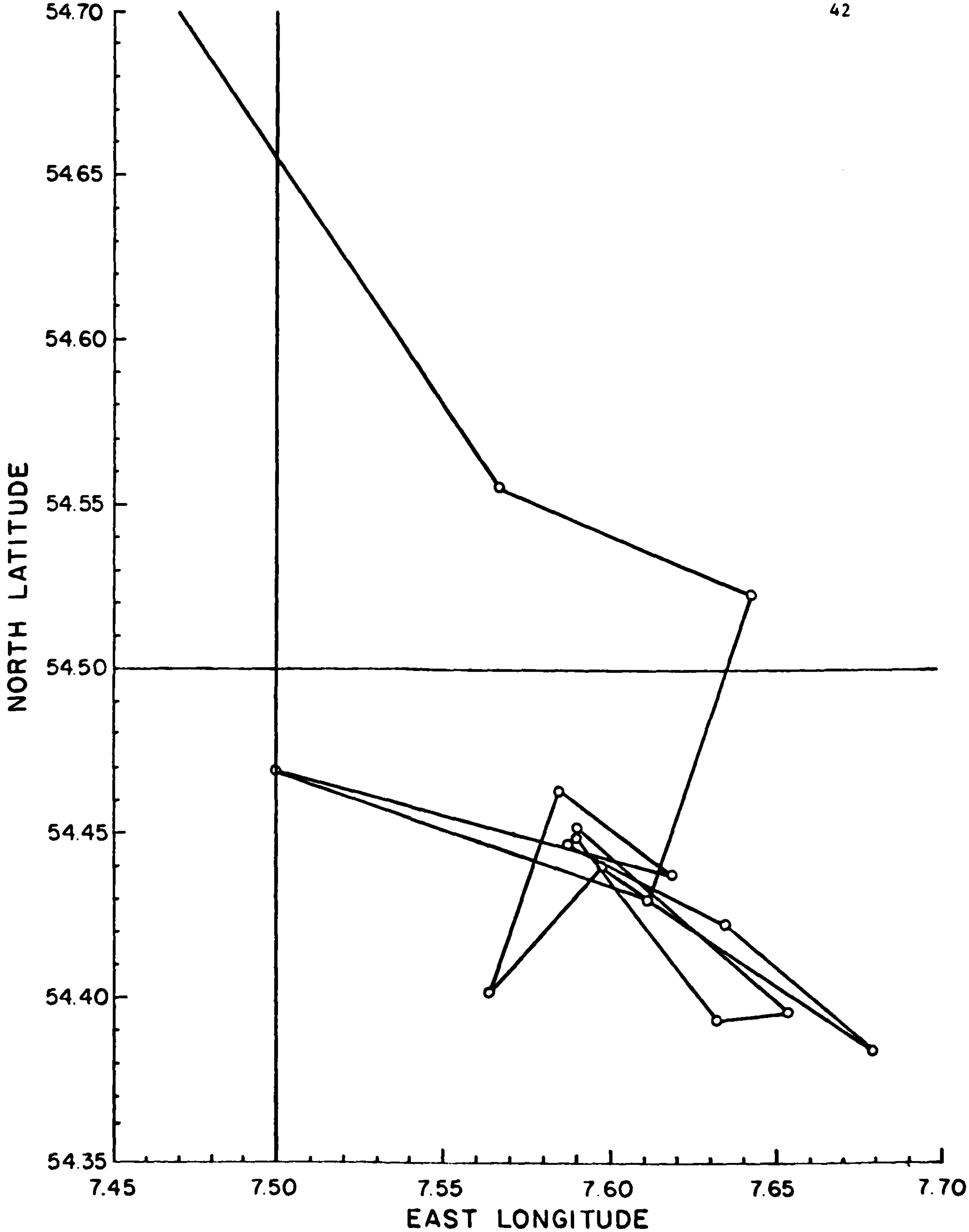

Figure 7. Position of buoy #397 for times shown in Table 5.

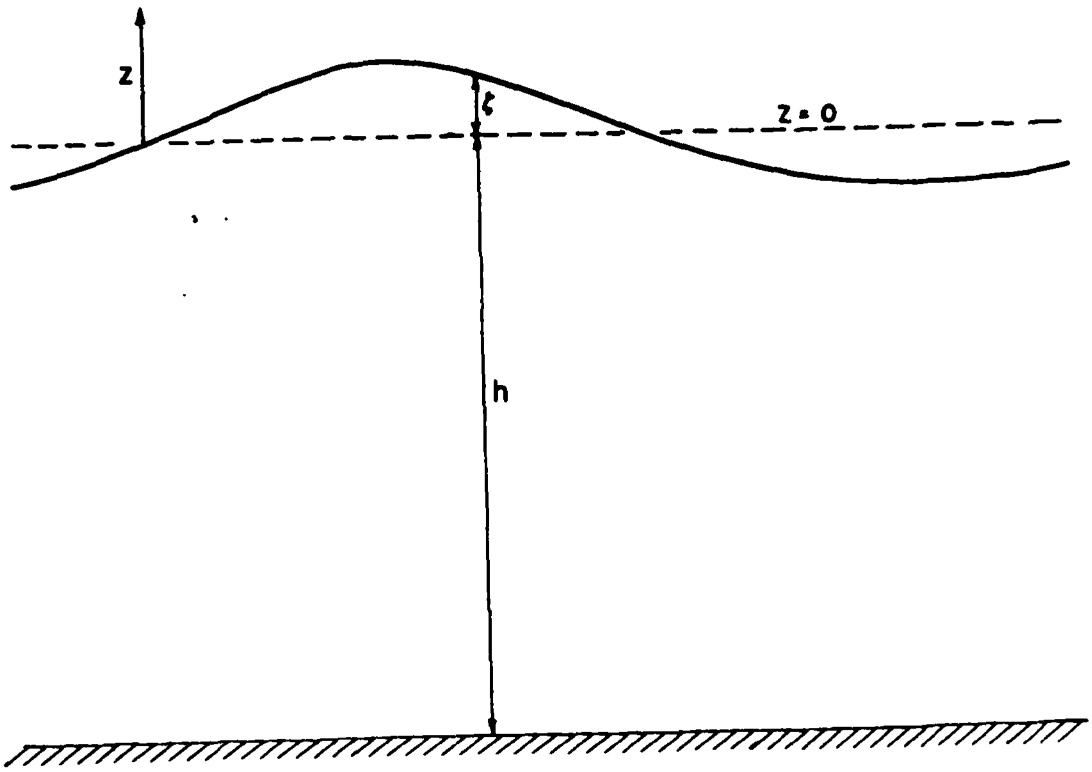

Figure 8. Definitions of variables used in wave model

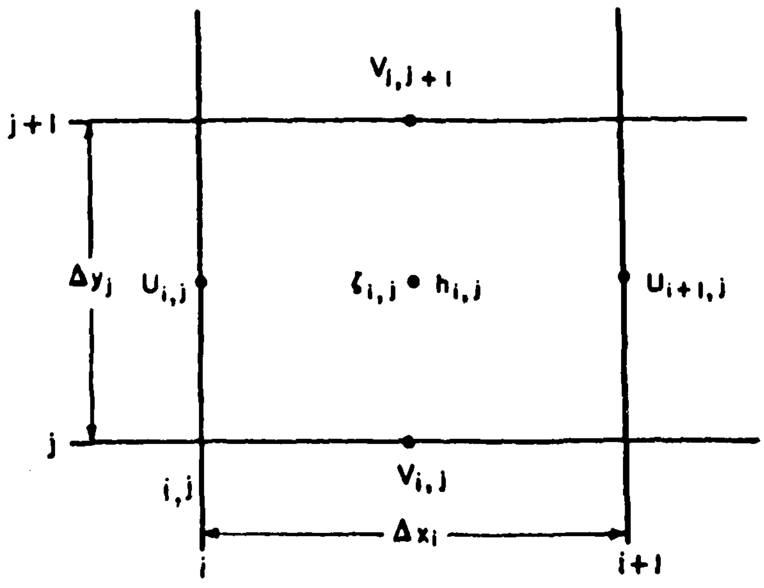

Figure 9. Discretization of variables used in numerical model.

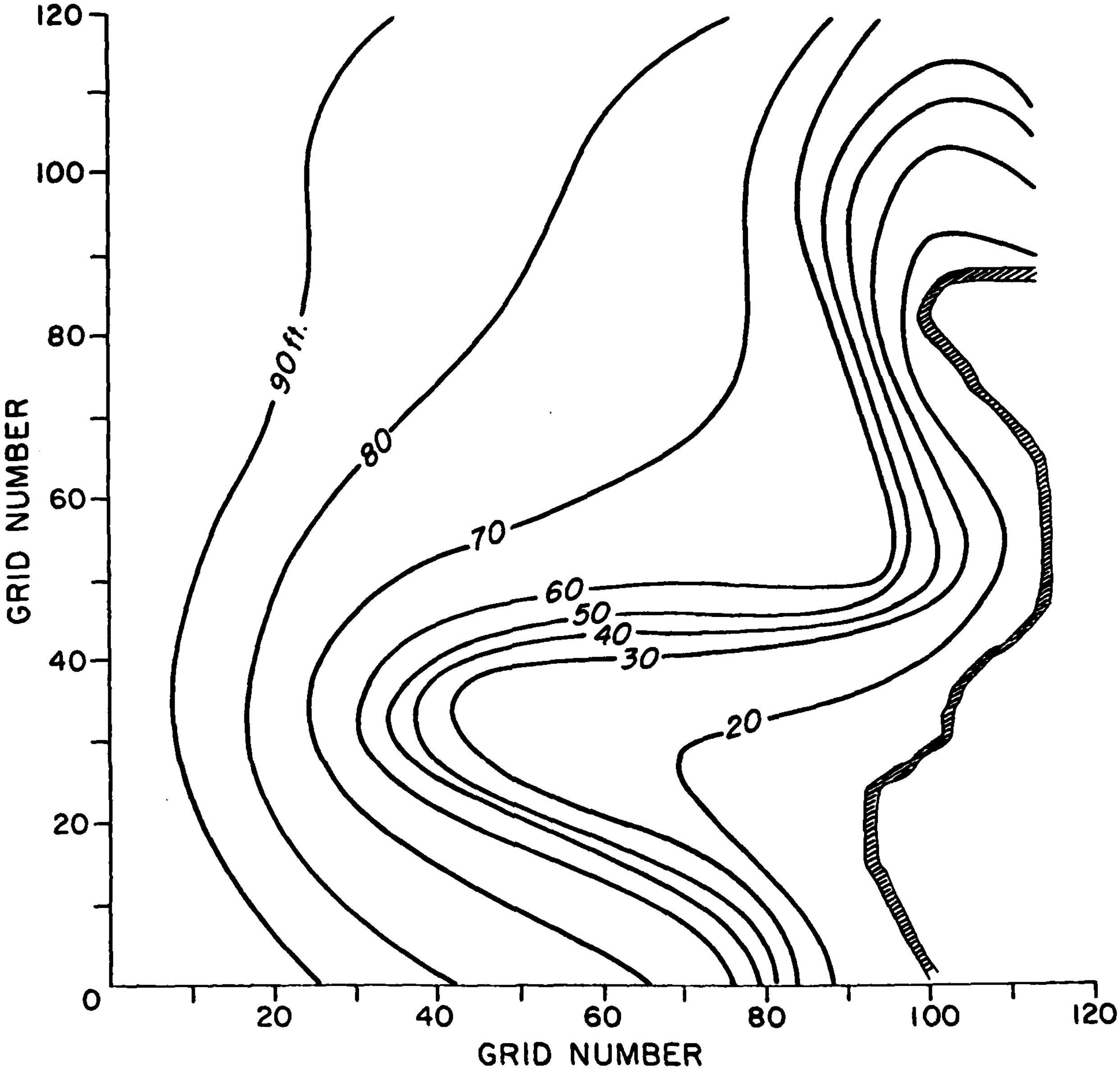

Figure 10. Bathymetry used in numerical model of leeward side of Rona Rock.

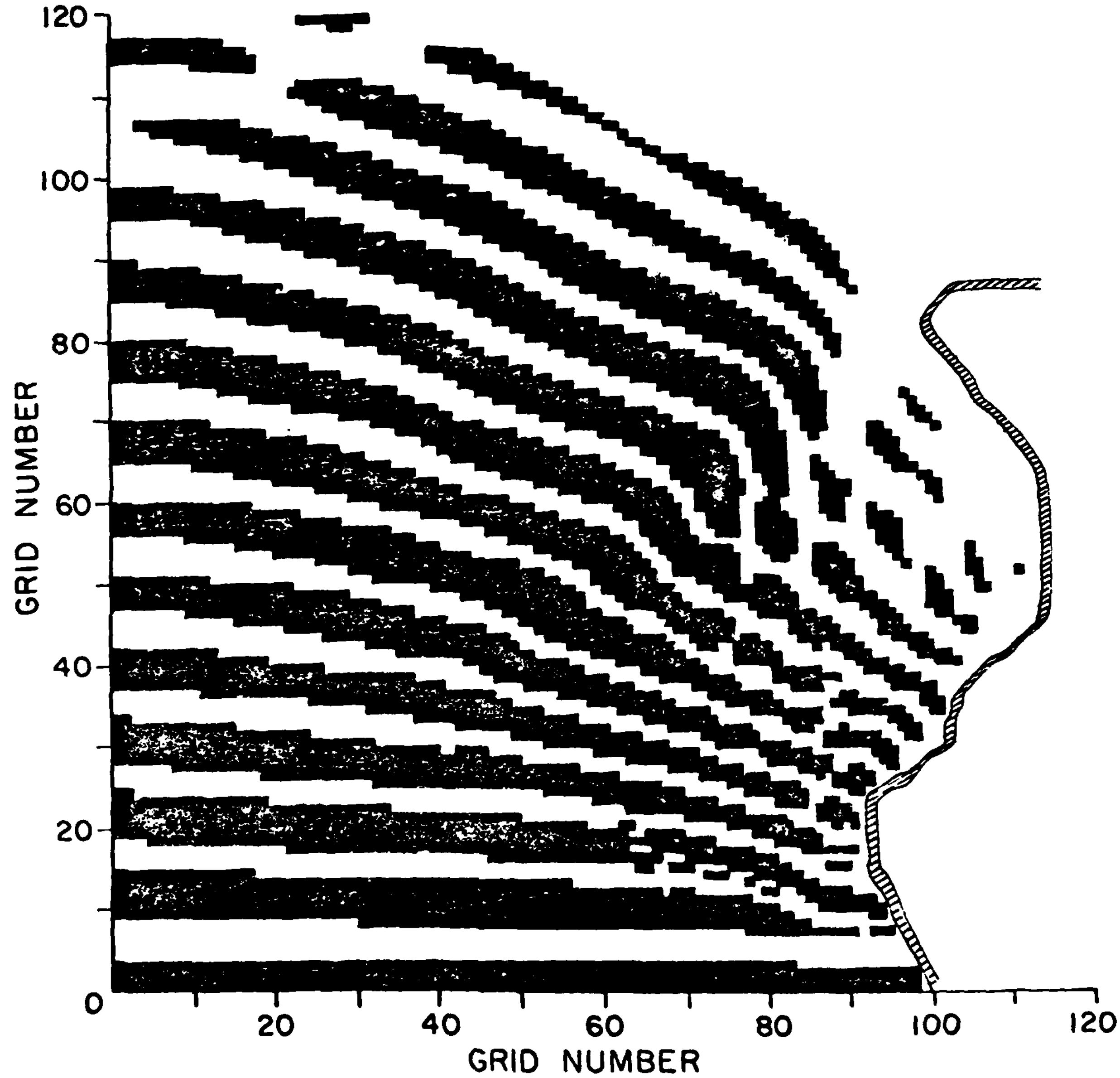

Figure 11. Elevations predicted for leeward side of Rona Rock using the numerical model. Dark is positive and white is negative elevation.

VII. APPENDIX

Appendix 1 - The Finite-Difference Equations of the General Wave Model

(See Section 4 for a description of symbols)

$$\frac{\zeta^{n+1}_{i,j} - [\zeta^{n}_{i,j}]}{\Delta t} + (\overline{H}u^{n}_{i+1,j}\ U^{n+1}_{i+1,j} - \overline{H}u^{n}_{i,j}\ U^{n+1}_{i,j})\ \overline{I}'_{i+1/2}$$

$$+ (\overline{H}v^{n}_{i,j+1}\ V^{n}_{i,j+1} - \overline{H}v^{n}_{i,j}\ V^{n}_{i,j})\ \overline{J}'_{j+1/2} = 0 \qquad A(i)$$

$$\frac{U^{n+1}_{i,j} - [U^{n}_{i,j}]}{\Delta t} + \overline{\alpha}u_{i,j}\ U^{n+1}_{i,j}\ \frac{(U^{n}_{i+1,j} - U^{n}_{i-1,j})}{2}\ I'_{i} + \overline{\alpha}u_{i,j}\ V^{*n}_{i,j}\ \frac{(U^{n}_{i,j+1} - U^{n}_{i,j-1})}{2}\ \overline{J}'_{j+1/2}$$

$$- f\ V^{*n}_{i,j} + \frac{\overline{S}u^{2}_{i,j}}{2\overline{H}u^{n}_{i,j}}\ [(\zeta^{n+1}_{i,j} - \zeta^{n+1}_{i-1,j}) + (\zeta^{n}_{i,j} - \zeta^{n}_{i-1,j})]\ I'_{i}$$

$$+ \frac{g}{2}\ (U^{n+1}_{i,j} + [U^{n}_{i,j}])\ \ [[U^{n}_{i,j}]^{2} + (V^{*n}_{i,j})^{2}]^{1/2} / \overline{H}\overline{U}^{n}_{i,j}\ (\overline{C}\overline{U}^{n}_{i,j})^{2} - \tau^{s}_{x} / \rho\overline{H}u^{n}_{i,j} \qquad A(ii)$$

$$+ U^{n}_{i,j}[U^{n}_{i,j}\ \overline{\alpha}xu_{i,j} + V^{*n}_{i,j}\alpha y_{i,j} + (1-\overline{\alpha}u_{i,j})\ \left(\frac{\partial\zeta}{\partial t}\right)^{n} / \overline{H}\overline{U}^{n}_{i,j}] = 0$$

$$\frac{V_{i,j}^{n+1} - [V_{i,j}^{n}]}{\Delta t} + \bar{\alpha}v_{i,j}\, U_{i,j}^{*n+1} \frac{(V_{i+1,j}^{n} - V_{i-1,j}^{n})}{2}\, \bar{I}'_{i+1/2} + \bar{\alpha}v_{i,j}\, V_{i,j}^{n+1} \frac{(V_{i,j+1}^{n} - V_{i,j-1}^{n})}{2} J'_j$$

$$+ f\, U_{i,j}^{*n+1} + \frac{\bar{S}v_{i,j}^{2}}{2\bar{H}v_{i,j}^{n+1}} [(\zeta_{i,j}^{n+1} - \zeta_{i,j-1}^{n+1}) + (\zeta_{i,j}^{n} - \zeta_{i,j-1}^{n})]\, J'_j \qquad \text{A(iii)}$$

$$+ g\, V_{i,j}^{n+1} [(U_{i,j}^{*n+1})^2 + [V_{i,j}^{n}]^2\,]^{1/2} / \bar{H}v_{i,j}^{n+1} (\bar{C}v_{i,j}^{n+1})^2 - \tau_y^{s}/\rho\, \bar{H}v_{i,j}^{n+1}$$

$$+ V_{i,j}^{n} [U_{i,j}^{*n+1} \alpha x_{i,j} + V_{i,j}^{n}\, \bar{\alpha}vv_{i,j} + (1 - \bar{\sigma}v_{i,j}) \left(\frac{\partial\zeta}{\partial t}\right)^{n} / \bar{H}v_{i,j}^{n+1}] = 0$$

$$\frac{\zeta_{i,j}^{n+2} - [\zeta_{i,j}^{n+1}]}{\Delta t} + (\bar{H}u_{i+1,j}^{n+1}\, U_{i+1,j}^{n+1} - \bar{H}u_{i,j}^{n+1}\, U_{i,j}^{n+1})\quad \bar{I}'_{i+1/2}$$

$$\text{A(iv)}$$

$$+ (\bar{H}v_{i,j+1}^{n+1}\, V_{i,j+1}^{n+2} - \bar{H}v_{i,j}^{n+1}\, V_{i,j}^{n+2})\quad \bar{J}'_{j+1/2} \quad = \quad 0$$

$$\frac{V_{i,j}^{n+2} - [V_{i,j}^{n+1}]}{\Delta t} + \bar{\alpha}v_{i,j}\, U_{i,j}^{*n+1} \frac{(V_{i+1,j}^{n+1} - V_{i-1,j}^{n+1})}{2}\, \bar{I}'_{i+1/2} + \bar{\alpha}v_{i,j}\, V_{i,j}^{n+2} \frac{(V_{i,j+1}^{n+1} - V_{i,j-1}^{n+1})}{2} J'_j$$

$$+ f\, U_{i,j}^{*n+1} + \frac{\bar{S}v_{i,j}^{2}}{2\bar{H}v_{i,j}^{n+1}} [(\zeta_{i,j}^{n+2} - \zeta_{i,j-1}^{n+2}) + (\zeta_{i,j}^{n+1} - \zeta_{i,j-1}^{n+1})]\quad J'_j$$

$$+ \frac{g}{2} (V_{i,j}^{n+2} + [V_{i,j}^{n+1}])\, [(U_{i,j}^{*n+1})^2 + [V_{i,j}^{n+1}]^2\,]^{1/2} / \bar{H}v_{i,j}^{n+1} (\bar{C}v_{i,j}^{n+1})^2 - \tau_y^{s}/\rho \bar{H}v_{i,j}^{n+1} \qquad \text{A(v)}$$

$$+ V_{i,j}^{n+1} [U_{i,j}^{*n+1}\, \alpha x_{i,j} + V_{i,j}^{n+1}\, \bar{\alpha}vv_{i,j} + (1 - \bar{\alpha}v_{i,j}) \left(\frac{\partial\zeta}{\partial t}\right)^{n+1} / \bar{H}v_{i,j}^{n+1}] = 0$$

$$\frac{U_{i,j}^{n+2} - [U_{i,j}^{n+1}]}{\Delta t} + \bar{\alpha}u_{i,j}\, U_{i,j}^{n+2}\, \frac{(U_{i+1,j}^{n+1} - U_{i-1,j}^{n+1})}{2}\quad I_i' + \bar{\alpha}u_{i,j}\, V_{i,j}^{*n+2}\frac{(U_{i,j+1}^{n+1} - U_{i,j-1}^{n+1})}{2}\, \bar{J}'_{j+1/2}$$

$$- f\, V_{i,j}^{*n+2} + \frac{\bar{S}u_{i,j}^2}{2\bar{H}u_{i,j}^{n+2}}\, [(\zeta_{i,j}^{n+2} - \zeta_{i-1,j}^{n+2}) + (\zeta_{i,j}^{n+1} - \zeta_{i-1,j}^{n+1})]\quad I_i'$$

$$+ g\, U_{i,j}^{n+2}\, [[U_{i,j}^{n+1}]^2 + (V_{*\,i,j}^{n+2})^2]^{1/2}\, /\bar{H}u_{i,j}^{n+2}\, (\bar{C}u_{i,j}^{n+2})^2 \quad - \quad \tau_x^s/\, \rho\, \bar{H}u_{i,j}^{n+2} \qquad \text{A(vi)}$$

$$+ U_{i,j}^{n+1}\, [U_{i,j}^{n+1}\, \bar{\alpha}xu_{i,j} + V_{i,j}^{*n}\, \alpha y_{i,j} + (1 - \bar{\alpha}u_{i,j})\left(\frac{\partial\zeta}{\partial t}\right)^{n+1}/\bar{H}u_{i,j}^{n+2}] = 0$$

A(ii): $\left(\frac{\partial\zeta}{\partial t}\right)^n = -(\bar{H}\bar{u}_{i+1,j} U_{i+1,j}^n - \bar{H}\bar{u}_{i,j}\, U_{i,j}^n)\bar{I}'_{i+1/2} - (\bar{H}\bar{v}_{i,j+1}\, V_{i,j+1}^n - \bar{H}\bar{v}_{i,j}\, Vn_{i,j})\bar{J}'_{j+1/2}$

A(iii): $\left(\frac{\partial\zeta}{\partial t}\right)^n = -(\bar{H}u_{i+1,j}^{n+1}\, U_{i+1,j}^{n+1} - \bar{H}u_{i,j}^{n+1}\, U_{i,j}^{n+1})\bar{I}'_{i+1/2} - (\bar{H}v_{i,j+1}^{n+1}\, V_{i,j+1}^n - \bar{H}v_{i,j}^{n+1}\, V_{i,j}^n)\bar{J}'_{j+1/2}$

A(V): $\left(\frac{\partial\zeta}{\partial t}\right)^{n+1} = -(\bar{H}u_{i+1,j}^{n+1}\, U_{i+1,j}^{n+1} - \bar{H}u_{i,j}^{n+1}\, U_{i,j}^{n+1})\bar{I}'_{i+1/2} - (\bar{H}v_{i,j+1}^{n+1}\, V_{i,j+1}^{n+1} - \bar{H}v_{i,j}^{n+1}\, V_{i,j}^{n+1})\bar{J}'_{j+1/2}$

A(Vi): $\left(\frac{\partial\zeta}{\partial t}\right)^{n+1} = -(\bar{H}u_{i+1,j}^{n+2}\, U_{i+1,j}^{n+1} - \bar{H}u_{i,j}^{n+2}\, U_{i,j}^{n+1})\bar{I}'_{i+1/2} - (\bar{H}v_{i,j+1}^{n+2}\, V_{i,j+1}^{n+2} - \bar{H}v_{i,j}^{n+2}\, V_{i,j}^{n+2})\bar{J}'_{j+1/2}$

Appendix 2 - Note on the Treatment of the Varying Land/Water Boundary

The time-varying land/water boundary for the beach model was handled by a method described in McHugh (1976). Immediately following the second, fourth, sixth, etc., time steps, a call is made to a program subroutine that determines whether flooding of a dry square can occur, and if so, transfers water into the dry square. The criterion for flooding is, in the case of a one-dimensional bottom slope parallel to x: $\zeta_{i-1} > -h_{i,j}$

The transferred water volume Δv is calculated from the formula

$$\Delta v = 0.52b\ (\zeta_{i-1,j} + h_{i,j})^{3/2}\ \Delta t$$

where b = 3.33 is the Francis weir constant (Giles (1962)). This formula is obtained by time integration of a variable crest weir flow over the interval $2\Delta t$, assuming the water level in the flooding square exceeds the bottom level in the flooded square during all of $2\Delta t$. The argument for this assumption in the case of the beach model is as follows: First, define a critical depth H_c below which a newly flooded square is considered still "dry". This strategy was adopted to avoid certain numerical problems (McHugh 1976). In the present study $H_c = 0.1$ ft. (0.03 m). With wave period 8 seconds and amplitude 1 ft. the water only rises approximately 0.01 ft. in 0.02 seconds, so that the new depth established in a dry square after flooding during time $2\Delta t = 0.025$ seconds, say, will be very much less than H_c. Consequently, several applications of the flooding formula will be necessary to establish a new depth greater than H_c. This means that for the second and all subsequent necessary applications $\zeta_{i-1,j}$ will already exceed $-h_{i,j}$ at the beginning of the interval $2\Delta t$.

The reverse situation to flooding of a grid square is ebbing of water from it. In general, when ebbing occurs a negative depth will be established by the computer program. This represents a volume debt to the wet field that must be restored by the program to conserve water volume (McHugh 1976).

Appendix 3. Output of Computer Model.

The following computer listings give the elevations of the sea surface at each grid point of the numerical model after 160 seconds of model time.

TIME=160 SECS

ZETA FT

	1	2	3	4	5	6	7	8	9	10	11	12	1
119	8.78	8.87	9.06	9.30	9.59	9.83	10.16	10.41	10.61	10.72	10.74	10.63	10
118	4.94	4.97	5.03	5.12	5.23	5.36	5.51	5.67	5.86	6.06	6.23	6.52	6
117	1.15	1.12	1.08	1.04	1.01	1.00	1.03	1.10	1.23	1.42	1.68	2.03	2
116	-1.03	-1.13	-1.21	-1.31	-1.41	-1.50	-1.56	-1.58	-1.55	-1.46	-1.30	-1.05	-0
115	-1.50	-1.55	-1.6[illegible]	-1.81	-1.97	-2.12	-2.27	-2.39	-2.47	-2.51	-2.49	-2.43	-2
114	-0.16	-0.24	-0.33	-0.57	-0.80	-1.05	-1.30	-1.55	-1.78	-1.98	-2.12	-2.21	-2
113	2.88	2.80	2.55	2.40	2.14	1.80	1.42	1.02	0.61	0.21	-0.16	-0.48	-0
112	6.67	6.64	6.57	6.45	6.26	5.99	5.66	5.25	4.77	4.24	3.68	3.11	2
111	8.73	8.80	8.92	9.07	9.21	9.33	9.39	9.38	9.27	9.04	8.67	8.16	7
110	7.43	7.61	7.84	8.18	8.60	9.09	9.63	10.19	10.73	11.20	11.56	11.74	11
109	4.51	4.60	4.77	5.04	5.41	5.89	6.46	7.13	7.89	8.70	9.54	10.37	11
108	2.03	2.06	2.11	2.21	2.36	2.57	2.85	3.22	3.66	4.20	4.84	5.57	6
107	0.65	0.64	0.61	0.59	0.57	0.55	0.56	0.61	0.69	0.84	1.06	1.36	1
106	0.13	0.10	0.05	-0.03	-0.13	-0.25	-0.39	-0.53	-0.56	-0.77	-0.83	-0.85	-0
105	0.42	0.35	0.30	0.18	0.04	-0.15	-0.35	-0.59	-0.83	-1.03	-1.37	-1.50	-1
104	1.82	1.75	1.62	1.43	1.20	0.94	0.64	0.31	-0.04	-0.40	-0.76	-1.11	-1
103	4.54	4.45	4.23	4.04	3.72	3.34	2.91	2.44	1.92	1.40	0.85	0.31	-0
102	7.52	7.49	7.41	7.26	7.04	6.73	6.33	5.84	5.27	4.62	3.91	3.15	2
101	8.11	8.18	8.31	8.49	8.60	8.70	8.74	8.69	8.52	8.23	7.80	7.22	6
100	5.10	5.30	5.59	5.93	6.24	6.73	7.26	7.83	8.39	8.91	9.34	9.63	9
99	1.15	1.21	1.34	1.55	1.80	2.32	2.83	3.56	4.36	5.26	6.24	7.27	8
98	-1.48	-1.47	-1.46	-1.40	-1.30	-1.12	-0.84	-0.47	0.01	0.52	1.36	2.25	3
97	-2.23	-2.25	-2.28	-2.31	-2.35	-2.36	-2.35	-2.30	-2.19	-2.01	-1.75	-1.39	-
96	-1.64	-1.65	-1.70	-1.76	-1.85	-1.97	-2.10	-2.24	-2.37	-2.48	-2.55	-2.59	-2
95	-0.24	-0.28	-0.35	-0.45	-0.59	-0.76	-0.95	-1.17	-1.41	-1.67	-1.93	-2.20	-2
94	1.88	1.81	1.67	1.47	1.24	0.97	0.69	0.38	0.05	-0.30	-0.66	-1.05	-1
93	5.15	5.06	4.88	4.61	4.27	3.86	3.41	2.91	2.38	1.84	1.29	0.74	0
92	8.65	8.64	8.59	8.48	8.29	7.99	7.57	7.04	6.41	5.68	4.90	4.09	3
91	8.83	8.95	9.17	9.45	9.73	9.99	10.17	10.24	10.13	9.95	9.56	8.98	[illegible]
90	4.51	4.65	4.93	5.37	5.85	6.49	7.19	7.97	8.73	9.59	10.32	10.92	11
89	-0.25	-0.21	-0.10	0.10	0.40	0.82	1.35	2.05	2.83	3.98	5.02	6.31	7
88	-2.35	-2.37	-2.39	-2.40	-2.36	-2.29	-2.15	-1.96	-1.67	-1.27	-0.70	0.07	1
87	-2.17	-2.18	-2.22	-2.28	-2.35	-2.44	-2.54	-2.66	-2.79	-2.89	-2.94	-2.97	-
86	-1.28	-1.29	-1.31	-1.35	-1.42	-1.51	-1.62	-1.79	-2.00	-2.26	-2.55	-2.84	-
85	-0.43	-0.47	-0.55	-0.66	-0.78	-0.90	-1.01	-1.10	-1.20	-1.34	-1.55	-1.92	-
84	1.72	1.60	1.37	1.05	0.71	0.34	0.00	-0.28	-0.50	-0.67	-0.84	-1.04	-1
83	6.64	6.51	6.24	5.83	5.31	4.69	3.99	3.26	2.53	1.85	1.22	0.62	0
82	10.98	10.99	10.98	10.96	10.85	10.64	10.23	9.73	8.99	8.07	7.02	5.85	[illegible]
81	8.58	8.71	8.96	9.35	9.85	10.44	11.09	11.72	12.25	12.61	12.70	12.47	1
80	2.24	2.31	2.47	2.73	3.14	3.72	4.49	5.48	6.67	8.04	9.51	11.04	1
79	-1.43	-1.41	-1.38	-1.34	-1.27	-1.14	-0.92	-0.57	-0.04	0.69	1.66	2.85	[illegible]
78	-2.14	-2.10	-2.04	-1.99	-1.97	-2.00	-2.06	-2.13	-2.19	-2.22	-2.18	-2.04	-
77	-2.34	-2.23	-2.10	-2.02	-1.89	-1.82	-1.82	-1.89	-2.04	-2.25	-2.51	-2.77	-
76	-2.71	-2.66	-2.58	-2.48	-2.38	-2.30	-2.24	-2.24	-2.30	-2.40	-2.51	-2.61	-
75	-1.59	-1.60	-1.72	-1.88	-1.96	-2.00	-2.23	-2.44	-2.64	-2.82	-2.95	-3.00	-
74	2.86	2.73	2.49	2.10	1.70	1.22	0.75	0.11	-0.56	-1.24	-1.86	-2.35	-
73	9.31	9.25	9.16	8.99	8.68	8.23	7.60	6.79	5.84	4.75	3.35	2.22	[illegible]
72	11.15	11.23	11.50	11.77	12.13	12.25	12.42	12.43	12.42	12.19	11.71	10.83	
71	6.17	6.27	6.47	6.73	7.21	7.77	8.48	9.35	10.37	11.49	12.56	13.77	1
70	1.04	1.02	0.98	0.93	1.05	1.26	1.65	2.23	3.00	3.93	5.05	6.46	[illegible]
69	-1.10	-1.16	-1.25	-1.42	-1.53	-1.56	-1.48	-1.32	-1.13	-0.93	-0.69	-0.33	[illegible]
68	-2.32	-2.33	-2.35	-2.39	-2.40	-2.37	-2.28	-2.19	-2.12	-2.10	-2.12	-2.22	-
67	-3.70	-3.69	-3.67	-3.65	-3.61	-3.53	-3.42	-3.29	-3.14	-2.90	-2.84	-2.78	-
66	-3.73	-3.79	-3.88	-4.02	-4.13	-4.25	-4.32	-4.37	-4.39	-4.35	-4.26	-4.12	-
65	-0.40	-0.54	-0.79	-1.14	-1.56	-2.00	-2.43	-2.94	-3.40	-3.57	-4.13	-4.63	-
64	6.22	6.17	5.97	5.55	5.10	4.31	3.76	2.87	1.88	0.79	-0.43	-1.72	-
63	10.95	11.20	11.30	11.33	11.30	11.25	11.04	10.66	10.12	9.27	[illegible]	7.04	
62	[illegible]	[illegible]	9.36	9.76	[illegible]	10.74	11.24	11.77	12.35	12.96	[illegible]	[illegible]	1

ZETA FT

	9	10	11	12	13	14	15	16	17	18	19	20	
1	10.51	10.72	10.74	10.63	10.36	9.90	9.26	8.43	7.43	6.30	5.08	3.83	119
7	5.30	6.06	6.23	6.52	6.70	6.99	7.13	7.30	7.30	7.15	6.81	6.25	118
3	1.20	1.42	1.63	2.03	2.48	3.03	3.69	4.43	5.23	6.04	6.80	7.42	117
3	1.55	-1.46	-1.30	-1.05	-0.71	-0.24	0.36	1.11	2.01	3.07	4.27	5.60	116
9	-2.47	-2.51	-2.49	-2.40	-2.22	-1.95	-1.55	-1.04	-0.37	0.45	1.46	2.67	115
5	-1.78	-1.98	-2.12	-2.21	-2.21	-2.12	-1.93	-1.62	-1.20	-0.64	0.04	0.88	114
0	0.61	0.21	-0.16	-0.46	-0.72	-0.87	-0.92	-0.85	-0.67	-0.38	0.01	0.48	113
0	1.77	4.24	3.63	3.11	2.55	2.04	1.60	1.26	1.01	0.86	0.81	0.82	112
2	5.27	9.04	8.67	8.16	7.51	6.73	5.86	4.95	4.04	3.17	2.37	1.67	111
9	0.73	11.20	11.36	11.74	11.68	11.35	10.69	9.73	8.48	7.03	5.47	3.90	110
3	7.30	8.70	9.54	10.37	11.13	11.76	12.17	12.27	11.96	11.20	9.97	8.33	99
2	3.66	4.20	4.34	5.57	6.41	7.34	8.35	9.41	10.42	11.28	11.82	11.88	98
1	0.69	0.84	1.06	1.36	1.78	2.32	3.02	3.90	5.00	6.32	7.83	9.46	97
3	-0.56	-0.77	-0.93	-0.85	-0.79	-0.65	-0.42	-0.06	0.45	1.16	2.14	3.46	96
9	-0.35	-1.03	-1.30	-1.50	-1.65	-1.76	-1.80	-1.79	-1.69	-1.50	-1.18	-0.68	95
1	0.14	-0.40	-0.76	-1.11	-1.42	-1.70	-1.93	-2.10	-2.21	-2.27	-2.28	-2.23	94
4	1.90	1.40	0.85	0.31	-0.22	-0.71	-1.15	-1.52	-1.83	-2.09	-2.31	-2.51	93
4	5.27	4.62	3.91	3.15	2.37	1.59	0.82	0.10	-0.55	-1.16	-1.69	-2.17	92
9	8.53	8.23	7.80	7.22	6.48	5.59	4.59	3.50	2.38	1.26	0.20	-0.77	91
3	8.39	9.51	9.34	9.63	9.72	9.56	9.13	8.40	7.38	6.12	4.68	3.17	90
6	4.36	5.26	6.24	7.27	8.30	9.29	10.16	10.82	11.18	11.16	10.66	9.71	89
7	0.01	0.52	1.36	2.25	3.29	4.48	5.83	7.31	8.83	10.45	11.89	13.04	88
7	2.19	-2.01	-1.75	-1.38	-0.89	-0.26	0.55	1.55	2.80	4.31	6.10	8.19	87
4	2.37	-2.43	-2.55	-2.59	-2.57	-2.48	-2.30	-2.01	-1.58	-0.95	-0.06	1.14	86
7	-1.41	-1.67	-1.93	-2.20	-2.45	-2.70	-2.92	-3.09	-3.19	-3.15	-3.00	-2.71	85
8	0.03	-0.30	-0.66	-1.05	-1.45	-1.87	-2.30	-2.71	-3.09	-3.43	-3.71	-3.93	84
1	2.33	1.84	1.29	0.74	0.19	-0.36	-0.92	-1.50	-2.09	-2.69	-3.28	-3.83	83
4	6.41	5.63	4.90	4.09	3.27	2.44	1.61	0.76	-0.11	-0.98	-1.86	-2.71	82
4	5.13	9.95	9.56	8.98	8.24	7.33	6.30	5.16	3.95	2.68	1.39	0.13	81
7	9.78	9.59	10.32	10.92	11.31	11.46	11.33	10.90	10.14	9.06	7.70	6.13	80
5	2.33	3.98	5.02	6.31	7.70	9.14	10.57	11.90	13.01	13.79	14.10	13.80	79
6	-1.67	-1.27	-0.70	0.07	1.09	2.38	3.93	5.74	7.79	10.01	12.27	14.40	78
6	2.79	-2.99	-2.94	-2.97	-2.66	-2.25	-1.61	-0.74	0.41	1.87	3.70	5.92	77
0	2.06	-2.26	-2.55	-2.84	-3.11	-3.33	-3.46	-3.49	-3.39	-3.13	-2.64	-1.86	76
7	-1.20	-1.34	-1.55	-1.82	-2.17	-2.59	-3.05	-3.53	-4.00	-4.44	-4.81	-5.05	75
3	0.50	-0.67	-0.84	-1.04	-1.30	-1.64	-2.07	-2.57	-3.14	-3.79	-4.48	-5.18	74
6	2.53	1.65	1.22	0.62	0.05	-0.59	-1.02	-1.52	-2.01	-2.51	-3.07	-3.72	73
3	8.99	8.07	7.02	5.85	4.61	3.33	2.10	0.97	0.02	-0.73	-1.30	-1.78	72
2	2.25	12.61	12.70	12.47	11.89	10.90	9.52	7.83	6.00	4.22	2.69	1.50	71
8	6.67	8.04	9.51	11.04	12.51	13.80	14.73	15.10	14.76	13.64	11.87	9.74	70
7	-0.74	0.59	1.66	2.89	4.42	6.30	8.56	11.09	13.71	16.09	17.79	18.42	69
3	-2.19	-2.22	-2.18	-2.04	-1.73	-1.17	-0.26	1.11	3.05	5.63	8.78	12.25	68
9	2.04	-2.26	-2.51	-2.77	-3.01	-3.24	-3.42	-3.50	-3.41	-3.01	-2.11	-0.54	67
4	2.30	-2.40	-2.51	-2.61	-2.73	-2.89	-3.16	-3.58	-4.16	-4.83	-5.45	-5.83	66
4	-2.64	-2.82	-2.95	-3.00	-2.97	-2.91	-2.89	-3.00	-3.29	-3.81	-4.55	-5.46	65
1	0.56	-1.24	-1.36	-2.39	-2.80	-3.09	-3.25	-3.30	-3.25	-3.24	-3.39	-3.78	64
9	5.84	4.75	3.55	2.23	0.84	-0.52	-1.70	-2.56	-3.08	-3.32	-3.38	-3.35	63
3	10.42	12.19	11.71	10.83	9.48	7.69	5.61	3.46	1.43	-0.31	-1.62	-2.47	62
5	0.37	11.49	12.66	13.77	14.71	15.30	15.27	14.36	12.54	10.06	7.33	4.72	61
3	3.00	3.93	5.05	6.46	8.27	10.43	12.92	15.30	17.24	18.43	18.66	17.82	60
2	-1.13	-0.93	-0.69	-0.33	0.24	1.10	2.34	4.11	6.54	9.62	13.13	16.59	59
9	-2.12	-2.10	-2.12	-2.22	-2.42	-2.71	-2.95	-2.96	-2.53	-1.57	-0.05	2.03	58
9	3.14	-2.99	-2.84	-2.75	-2.81	-3.05	-3.40	-3.76	-4.10	-4.45	-4.81	-5.03	57
7	4.39	-4.35	-4.26	-4.12	-3.96	-3.78	-3.57	-3.41	-3.41	-3.68	-4.21	-4.91	56
8	-3.49	-3.97	-4.43	-4.83	-5.09	-5.12	-4.90	-4.54	-4.17	-3.88	-3.70	-3.69	55
7	1.88	0.79	-0.43	-1.72	-2.93	-3.93	-4.67	-5.15	-5.30	-5.30	-4.98	-4.52	54
5	0.12	9.37	8.36	7.04	5.44	3.63	1.64	-0.33	-2.09	-3.46	-4.40	-4.96	53
7	12.35	12.96	13.57	14.07	14.33	14.13	13.29	11.74	9.61	7.05	4.27	1.55	52
													51
													50

	1	2	3	4	5	6	7	8	9	10	11	12
61	3.93	4.06	4.22	4.46	4.75	5.09	5.47	5.96	6.59	7.40	8.44	9.77
60	0.18	0.21	0.23	0.38	0.51	0.65	0.81	1.01	1.23	1.48	1.83	2.32
59	-2.63	-2.80	-2.74	-2.65	-2.53	-2.37	-2.17	-1.96	-1.75	-1.54	-1.31	-1.09
58	-5.09	-5.09	-5.08	-5.06	-5.02	-4.93	-4.80	-4.64	-4.44	-4.17	-3.80	-3.33
57	-5.17	-5.22	-5.32	-5.46	-5.63	-5.80	-5.97	-6.14	-6.26	-6.29	-6.17	-5.92
56	-1.96	-2.05	-2.24	-2.52	-2.89	-3.34	-3.86	-4.45	-5.07	-5.66	-6.16	-6.55
55	3.81	3.74	3.58	3.32	2.96	2.51	1.93	1.25	0.42	-0.55	-1.63	-2.83
54	8.97	8.97	8.94	8.83	8.78	8.66	8.50	8.28	7.95	7.46	6.71	5.64
53	10.44	10.50	10.57	10.66	10.76	10.89	11.07	11.28	11.54	11.84	12.12	12.31
52	7.46	7.53	7.65	7.81	8.02	8.23	8.57	8.90	9.26	9.70	10.25	10.93
51	1.49	1.55	1.67	1.86	2.12	2.48	2.91	3.40	3.94	4.49	5.03	5.58
50	-4.05	-4.03	-3.92	-3.89	-3.73	-3.49	-3.16	-2.72	-2.16	-1.51	-0.82	-0.13
49	-6.45	-6.48	-6.53	-6.60	-6.68	-6.74	-6.76	-6.72	-6.56	-6.28	-5.86	-5.32
48	-5.33	-5.39	-5.60	-5.63	-5.93	-6.26	-6.63	-7.04	-7.41	-7.71	-7.91	-7.99
47	-2.05	-2.10	-2.19	-2.34	-2.57	-2.92	-3.39	-3.97	-4.62	-5.32	-6.05	-6.76
46	1.60	1.59	1.53	1.46	1.35	1.20	0.96	0.62	0.17	-0.43	-1.19	-2.10
45	6.04	6.00	5.91	5.80	5.67	5.52	5.37	5.20	5.00	4.72	4.31	3.73
44	11.39	11.38	11.36	11.31	11.21	11.05	10.81	10.54	10.24	9.91	9.54	9.14
43	10.37	10.51	10.76	11.09	11.43	11.83	12.27	12.60	12.84	12.98	12.99	12.90
42	1.16	1.26	1.47	1.81	2.30	2.96	3.77	4.72	5.76	6.85	7.93	8.93
41	-5.60	-5.65	-5.71	-5.74	-5.69	-5.54	-5.26	-4.82	-4.21	-3.45	-2.55	-1.51
40	-6.39	-6.50	-6.69	-6.93	-7.19	-7.45	-7.57	-7.35	-7.77	-8.01	-7.98	-7.34
39	-4.21	-4.28	-4.44	-4.67	-4.96	-5.31	-5.71	-6.15	-6.61	-7.08	-7.55	-8.01
38	-2.27	-2.29	-2.33	-2.38	-2.46	-2.59	-2.79	-3.07	-3.42	-3.85	-4.37	-4.95
37	-1.32	-1.37	-1.43	-1.49	-1.53	-1.54	-1.54	-1.53	-1.53	-1.59	-1.72	-1.94
36	3.73	3.59	3.33	2.97	2.56	2.13	1.70	1.29	0.93	0.59	0.27	-0.03
35	13.12	13.11	13.04	12.89	12.61	12.20	11.64	10.95	10.14	9.24	8.23	7.12
34	11.53	11.77	12.19	12.77	13.43	14.12	14.79	15.40	15.90	16.26	16.46	16.44
33	-0.37	-0.25	0.01	0.42	1.00	1.75	2.65	3.71	4.89	6.18	7.58	9.07
32	-6.06	-6.11	-6.13	-6.25	-6.29	-6.29	-6.20	-6.03	-5.75	-5.36	-4.85	-4.20
31	-5.09	-5.14	-5.26	-5.44	-5.69	-5.99	-6.32	-6.65	-6.98	-7.30	-7.62	-7.89
30	-3.63	-3.60	-3.57	-3.57	-3.64	-3.78	-3.98	-4.22	-4.50	-4.80	-5.11	-5.47
29	-4.51	-4.44	-4.32	-4.19	-4.07	-3.98	-3.93	-3.90	-3.88	-3.84	-3.76	-3.67
28	-4.48	-4.52	-4.57	-4.64	-4.72	-4.81	-4.90	-4.97	-5.01	-4.98	-4.87	-4.68
27	2.77	2.62	2.34	1.92	1.33	0.75	0.05	-0.67	-1.40	-2.10	-2.72	-3.22
26	13.86	13.88	13.85	13.72	13.45	13.04	12.51	11.85	11.06	10.14	9.11	7.98
25	11.27	11.53	11.91	12.54	13.13	13.73	14.31	14.89	15.47	16.06	16.62	17.08
24	-0.26	-0.14	0.10	0.45	0.88	1.36	1.91	2.54	3.29	4.18	5.24	6.44
23	-4.13	-4.16	-4.21	-4.26	-4.32	-4.39	-4.47	-4.55	-4.61	-4.60	-4.50	-4.28
22	-3.50	-3.53	-3.58	-3.64	-3.70	-3.76	-3.83	-3.95	-4.11	-4.34	-4.62	-4.93
21	-4.32	-4.33	-4.31	-4.29	-4.26	-4.20	-4.11	-4.00	-3.89	-3.79	-3.72	-3.71
20	-6.86	-6.95	-6.94	-6.80	-6.73	-6.64	-6.52	-6.37	-6.13	-5.93	-5.78	-5.60
19	-6.39	-6.44	-6.53	-6.65	-6.80	-6.98	-7.17	-7.32	-7.44	-7.51	-7.56	-7.58
18	0.65	0.53	0.43	0.21	-0.09	-0.48	-0.95	-1.46	-2.01	-2.59	-3.21	-3.85
17	11.26	11.20	11.07	10.90	10.67	10.43	10.15	9.80	9.30	8.38	8.29	7.62
16	12.05	12.04	12.05	12.10	12.23	12.49	12.83	13.23	13.63	13.94	14.12	14.18
15	3.66	3.66	3.67	3.71	3.80	3.96	4.20	4.55	4.99	5.50	6.02	6.54
14	-0.29	-0.31	-0.34	-0.37	-0.39	-0.42	-0.43	-0.42	-0.40	-0.40	-0.44	-0.49
13	-2.35	-2.35	-2.35	-2.35	-2.34	-2.31	-2.25	-2.17	-2.05	-1.90	-1.73	-1.70
12	-5.10	-5.11	-5.11	-5.10	-5.05	-4.98	-4.89	-4.81	-4.72	-4.63	-4.54	-4.46
11	-8.35	-8.38	-8.41	-8.42	-8.40	-8.35	-8.23	-8.17	-8.03	-7.86	-7.69	-7.56
10	-7.47	-7.52	-7.61	-7.71	-7.81	-7.94	-8.07	-8.22	-8.35	-8.46	-8.56	-8.66
9	-2.55	-2.57	-2.67	-2.79	-2.91	-3.04	-3.17	-3.31	-3.45	-3.58	-3.74	-3.93
8	5.69	5.65	5.56	5.43	5.29	5.14	4.93	4.80	4.60	4.40	4.19	3.99
7	9.95	9.97	9.99	10.02	10.05	10.10	10.13	10.15	10.14	10.12	10.09	10.05
6	7.95	7.96	7.95	7.95	7.96	7.98	8.00	8.02	8.03	8.03	8.06	8.13
5	5.18	5.19	5.20	5.21	5.23	5.25	5.27	5.29	5.28	5.26	5.25	5.21
4	0.61	0.62	0.63	0.65	0.67	0.71	0.75	0.79	0.83	0.89	0.93	1.00
3	[illegible]	[illegible]	-4.46	-4.45	-4.44	-4.42	-4.40	-4.38	-4.36	-4.34	-4.33	-4.31
2	[illegible]	-3.31	-3.32	[illegible]	-3.32	-3.31	-3.30	-3.29	-3.28	-3.26	-3.25	-3.23
1	[illegible]	[illegible]	-2.67	[illegible]	[illegible]	-8.67	-8.67	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

	[illegible]	7.40	8.44	9.77	11.40	13.24	15.13	16.33	18.10	18.50	17.64	16.14	61
	1.23	1.49	1.83	2.33	3.03	3.98	5.28	7.04	9.26	11.84	14.64	17.47	60
96	-1.75	-1.54	-1.31	-1.09	-0.93	-0.85	-0.78	-0.63	-0.31	0.31	1.49	3.40	59
64	-4.44	-4.17	-3.80	-3.38	-2.98	-2.69	-2.52	-2.49	-2.67	-2.97	-3.23	-3.37	58
1	-6.26	-6.29	-6.17	-5.92	-5.59	-5.13	-4.70	-4.25	-3.91	-3.69	-3.61	-3.73	57
45	-5.07	-5.66	-6.16	-6.58	-6.90	-7.04	-6.96	-6.72	-6.36	-5.87	-5.28	-4.73	56
25	0.42	-0.55	-1.63	-2.83	-4.05	-5.18	-6.11	-6.84	-7.34	-7.51	-7.37	-7.02	55
2	7.05	7.46	6.71	5.64	4.24	2.59	0.77	-1.15	-3.00	-4.57	-5.80	-6.74	54
2	11.54	11.84	12.12	12.31	12.32	12.03	11.29	9.98	8.17	6.02	3.61	1.05	53
90	9.26	9.70	10.25	10.93	11.78	12.78	13.82	14.75	15.50	15.92	15.70	14.64	52
41	3.94	4.49	5.03	5.58	6.17	6.84	7.63	8.61	9.93	11.61	13.48	15.42	51
7	-2.16	-1.51	-0.82	-0.13	0.55	1.16	1.69	2.17	2.68	3.31	4.06	5.07	50
72	-6.56	-6.28	-5.86	-5.33	-4.69	-3.99	-3.27	-2.58	-1.92	-1.35	-0.93	-0.62	49
07	-7.41	-7.71	-7.91	-7.99	-7.92	-7.68	-7.32	-6.83	-6.20	-5.47	-4.73	-4.00	48
9	-4.62	-5.32	-6.05	-6.76	-7.40	-7.93	-8.35	-8.62	-8.69	-8.54	-8.20	-7.65	47
62	0.17	-0.43	-1.19	-2.10	-3.10	-4.17	-5.27	-6.33	-7.27	-8.06	-8.67	-9.06	46
29	5.03	4.72	4.31	3.75	3.02	2.14	1.07	-0.15	-1.45	-2.83	-4.28	-5.72	45
5	10.24	9.91	9.54	9.14	8.72	8.27	7.74	7.10	6.35	5.45	4.29	2.83	44
6	12.84	12.98	12.99	12.90	12.76	12.59	12.39	12.18	11.98	11.78	11.56	11.26	43
72	5.76	6.85	7.93	8.93	9.87	10.72	11.44	12.02	12.48	12.82	13.05	13.25	42
5.	-4.21	-3.45	-2.55	-1.51	-0.34	0.98	2.42	3.91	5.40	6.81	7.99	8.87	41
3	-7.97	-8.01	-7.98	-7.84	-7.56	-7.09	-6.41	-5.51	-4.36	-2.98	-1.48	0.01	40
15	-6.61	-7.08	-7.55	-8.01	-8.41	-8.73	-8.96	-9.08	-9.05	-8.80	-8.32	-7.60	39
.07	-3.42	-3.85	-4.37	-4.95	-5.57	-6.19	-6.83	-7.50	-8.17	-8.80	-9.34	-9.74	38
5	-1.53	-1.59	-1.72	-1.94	-2.23	-2.59	-3.04	-3.60	-4.29	-5.10	-6.02	-7.00	37
29	0.93	0.59	0.27	-0.03	-0.27	-0.43	-0.52	-0.60	-0.75	-1.01	-1.44	-2.08	36
.95	10.14	9.24	8.23	7.12	5.99	4.91	3.97	3.21	2.67	2.34	2.12	1.90	35
4	15.90	16.26	16.46	16.44	16.14	15.54	14.64	13.48	12.18	10.86	9.63	8.54	34
.7	4.39	6.18	7.58	9.07	10.63	12.20	13.72	15.08	16.14	16.83	17.08	16.90	33
03	-5.75	-5.36	-4.85	-4.20	-3.37	-2.31	-1.01	0.56	2.36	4.34	6.39	8.41	32
.6	-6.98	-7.30	-7.62	-7.89	-8.10	-8.22	-8.19	-8.00	-7.65	-7.16	-6.52	-5.70	31
.2	-4.50	-4.80	-5.11	-5.47	-5.90	-6.41	-6.96	-7.49	-8.00	-8.46	-8.85	-9.16	30
90	-3.83	-3.84	-3.76	-3.67	-3.62	-3.65	-3.80	-4.09	-4.52	-5.09	-5.74	-6.39	29
.97	-5.01	-4.98	-4.87	-4.68	-4.43	-4.17	-3.94	-3.74	-3.58	-3.49	-3.47	-3.52	28
.6	-1.40	-2.10	-2.72	-3.22	-3.60	-3.88	-4.08	-4.23	-4.34	-4.42	-4.42	-4.31	27
.85	11.06	10.14	9.11	7.98	6.76	5.51	4.24	3.01	1.84	0.73	-0.27	-1.14	26
.89	15.47	16.06	16.52	17.00	17.37	17.41	17.15	16.62	15.82	14.78	13.57	12.29	25
.5	3.29	4.18	5.24	6.44	7.75	9.09	10.45	11.81	13.11	14.31	15.35	16.22	24
.55	-4.61	-4.60	-4.50	-4.28	-3.96	-3.55	-3.05	-2.45	-1.74	-0.95	-0.08	0.91	23
95	-4.11	-4.34	-4.62	-4.93	-5.25	-5.57	-5.83	-6.03	-6.17	-6.27	-6.36	-6.45	22
.0	-3.89	-3.79	-3.72	-3.71	-3.73	-3.80	-3.90	-4.03	-4.20	-4.44	-4.73	-5.02	21
.3	-6.13	-5.98	-5.78	-5.60	-5.45	-5.28	-5.09	-4.83	-4.54	-4.25	-4.05	-3.95	20
.33	-7.44	-7.51	-7.56	-7.58	-7.57	-7.53	-7.47	-7.37	-7.25	-7.11	-6.93	-6.71	19
.4	-2.01	-2.59	-3.21	-3.85	-4.49	-5.08	-5.57	-5.92	-6.15	-6.33	-6.53	-6.80	18
.8	9.30	8.88	8.29	7.62	6.90	6.13	5.31	4.45	3.62	2.83	2.08	1.37	17
.23	13.63	13.94	14.12	14.18	14.17	14.16	14.17	14.17	14.19	14.18	14.04	13.71	16
.55	4.99	5.50	6.02	6.54	7.04	7.51	7.93	8.31	8.74	9.27	9.87	10.49	15
.4	-0.40	-0.40	-0.44	-0.49	-0.53	-0.51	-0.43	-0.29	-0.08	0.17	0.39	0.52	14
.1	-2.05	-1.90	-1.78	-1.70	-1.70	-1.77	-1.92	-2.11	-2.27	-2.35	-2.34	-2.31	13
.81	-4.72	-4.63	-4.54	-4.46	-4.37	-4.25	-4.10	-3.93	-3.74	-3.53	-3.36	-3.25	12
.1	-8.03	-7.86	-7.69	-7.56	-7.50	-7.48	-7.50	-7.51	-7.50	-7.41	-7.20	-6.91	11
.2	-8.35	-8.46	-8.56	-8.66	-8.77	-8.85	-8.87	-8.86	-8.85	-8.82	-8.80	-8.80	10
.31	-3.45	-3.58	-3.74	-3.95	-4.22	-4.54	-4.87	-5.22	-5.56	-5.85	-6.03	-6.12	9
.8	4.60	4.40	4.19	3.98	3.77	3.57	3.40	3.25	3.09	2.91	2.71	2.48	8
.1	10.14	10.12	10.09	10.05	9.99	9.89	9.77	9.62	9.48	9.36	9.33	9.38	7
.02	8.03	8.03	8.06	8.13	8.22	8.32	8.42	8.54	8.66	8.78	8.86	8.89	6
.29	5.28	5.26	5.25	5.24	5.22	5.18	5.12	5.06	5.01	4.97	4.95	4.97	5
.7	0.83	0.88	0.93	1.00	1.08	1.17	1.27	1.39	1.51	1.59	1.60	1.57	4
.3	-4.36	-4.34	-4.33	-4.31	-4.29	-4.27	-4.25	-4.21	-4.17	-4.15	-4.14	-4.11	3
.29	-8.28	-8.26	-8.25	-8.23	-8.22	-8.20	-8.17	-8.13	-8.09	-8.07	-8.09	-8.12	2
.0	-8.67	-8.67	-8.67	-8.67	-8.67	-8.67	-8.67	-8.67	-8.67	-8.67	-8.67	-8.67	1
	9	10	11	12	13	14	15	16	17	18	19	20	

	21	22	23	24	25	26	27	28	29	30	31	32
119	2.61	1.49	0.51	-0.29	-0.89	-1.30	-1.52	-1.56	-1.45	-1.19	-0.30	-0.29
118	5.52	4.61	3.61	2.60	1.67	0.38	0.20	-0.08	-0.22	-0.15	0.12	0.55
117	7.83	7.94	7.72	7.16	6.32	5.31	4.23	3.34	2.63	2.18	2.02	2.11
116	6.99	8.35	9.56	10.48	10.97	10.95	10.41	9.43	8.20	6.94	5.83	4.96
115	4.09	5.73	7.57	9.53	11.51	13.31	14.70	15.30	13.23	14.17	12.42	[illegible]
114	1.88	3.36	4.45	6.10	8.00	10.16	12.49	14.80	16.80	18.04	18.15	16.77
113	1.05	1.69	2.41	3.24	4.19	5.32	6.70	8.39	10.44	12.76	15.08	16.96
112	0.89	0.99	1.12	1.27	1.44	1.66	1.93	2.47	3.25	4.45	6.20	8.50
111	1.05	0.54	0.11	-0.25	-0.55	-0.79	-0.97	-1.36	-1.02	-0.77	-0.20	0.78
110	2.42	1.09	-0.34	-0.96	-1.69	-2.25	-2.67	-2.97	-3.16	-3.22	-3.14	-2.89
109	6.38	4.30	2.27	0.43	-1.10	-2.23	-3.14	-3.73	-4.11	-4.32	-4.40	-4.38
108	11.31	10.03	8.03	5.67	3.11	0.73	-1.24	-2.72	-3.74	-4.38	-4.74	-4.91
107	11.04	12.33	12.97	12.65	11.18	8.68	5.61	2.53	-0.11	-2.12	-3.47	-4.32
106	5.19	7.34	9.85	12.47	14.72	15.91	15.50	13.33	[illegible]	6.14	2.58	-1.26
105	0.07	1.13	2.77	5.00	7.92	11.46	15.15	18.20	19.63	18.85	15.94	11.71
104	-2.13	-1.92	-1.54	-0.83	0.23	2.02	4.71	8.42	12.96	17.65	21.33	22.91
103	-2.71	-2.90	-3.09	-3.20	-3.18	-2.92	-2.31	-1.14	0.87	3.97	8.28	13.52
102	-2.62	-3.03	-3.42	-3.79	-4.12	-4.30	-4.55	-4.59	-4.41	-3.32	-2.61	-1.31
101	-1.63	-2.76	-3.60	-3.55	-4.36	-4.53	-4.96	-5.34	-5.65	-5.84	-5.37	-5.63
100	1.65	0.22	-1.55	-2.13	-3.04	-3.81	-4.43	-5.07	-5.53	-6.00	-6.34	-6.56
99	8.26	6.41	4.34	2.26	0.37	-1.22	-2.51	-3.57	-4.46	-5.20	-5.79	-6.25
98	13.70	13.64	12.71	10.91	8.47	5.78	3.20	0.93	-0.98	-2.56	-3.53	-4.33
97	10.52	12.93	15.12	16.64	17.05	16.07	13.83	10.95	7.77	4.68	1.88	-0.50
96	2.74	4.92	7.45	10.57	13.91	16.94	19.02	19.71	18.33	16.74	13.65	10.03
95	-2.24	-1.51	-0.42	1.14	3.32	6.22	9.72	13.48	16.98	19.68	21.12	21.03
94	-4.03	-4.13	-4.07	-3.80	-3.22	-2.21	-0.65	1.58	4.43	7.96	11.81	15.71
93	-4.35	-4.91	-5.19	-5.46	-5.56	-5.44	-5.07	-4.40	-3.36	-1.38	0.09	2.63
92	-3.52	-4.26	-4.92	-5.49	-5.94	-6.25	-6.37	-6.30	-6.03	-5.56	-4.87	-3.96
91	-1.06	-2.14	-3.13	-4.04	-4.96	-5.57	-6.14	-6.51	-6.67	-6.63	-6.43	-6.08
90	4.45	2.73	1.13	-0.30	-1.67	-2.94	-4.11	-5.11	-5.39	-6.11	-6.65	-6.70
89	12.86	11.34	9.41	7.31	5.17	3.09	1.06	-0.90	-2.69	-4.19	-5.30	-6.05
88	16.13	17.13	17.34	16.58	15.05	12.90	10.53	7.91	5.06	2.19	-0.14	-2.61
87	8.50	11.33	14.11	16.50	18.15	18.87	18.73	17.82	16.11	13.53	10.33	6.71
86	-0.70	0.97	3.17	5.85	8.91	11.75	14.45	16.78	18.63	19.22	20.01	18.56
85	-5.03	-4.82	-4.16	-3.04	-1.40	0.72	3.20	5.90	8.77	11.81	14.57	16.01
84	-5.82	-6.34	-6.64	-6.62	-6.20	-5.36	-4.13	-2.62	-0.84	1.17	3.47	6.16
83	-4.49	-5.34	-6.17	-6.84	-7.25	-7.31	-7.03	-6.44	-5.53	-4.51	-3.29	-1.92
82	-2.20	-2.93	-3.82	-4.82	-5.82	-6.65	-7.18	-7.39	-7.30	-6.94	-6.34	-5.58
81	0.65	0.02	-0.62	-1.45	-2.53	-3.78	-5.00	-6.05	-6.32	-7.27	-7.42	-7.27
80	7.60	5.75	4.30	3.15	2.06	0.83	-0.62	-2.22	-3.80	-5.23	-6.36	-7.12
79	17.84	16.24	14.06	11.75	9.60	7.68	5.88	4.05	2.09	-0.02	-2.14	-4.06
78	15.59	18.21	19.63	19.77	18.75	16.97	14.83	12.73	10.62	8.44	6.06	3.39
77	1.31	4.67	8.40	11.98	15.14	17.43	18.63	18.80	18.20	17.14	15.75	13.71
76	-5.82	-5.24	-3.93	-1.35	0.86	4.31	8.05	11.65	14.57	16.39	19.31	19.06
75	-6.37	-7.11	-7.52	-7.45	-6.92	-5.70	-3.79	-1.19	1.98	5.45	9.00	12.04
74	-4.44	[illegible]	-6.16	-6.97	-7.60	-7.91	-7.87	-7.37	-6.32	-4.67	-2.41	0.38
73	-3.34	-3.43	-3.77	-4.39	-5.21	-6.16	-7.07	-7.73	-8.21	-8.24	-7.78	-6.72
72	-2.85	-2.88	-2.75	[illegible]	-2.95	-3.37	-4.25	-5.35	-6.52	-7.56	-8.32	-8.67
71	2.57	1.00	-0.37	-1.06	-1.39	-1.57	-1.84	-2.40	-3.33	-4.57	-5.95	-7.24
70	15.91	13.17	10.00	[illegible]	4.54	2.57	1.18	0.24	-0.46	-1.21	-2.24	-3.60
69	19.33	21.05	21.37	20.70	17.99	14.81	11.23	7.95	5.22	3.26	1.90	0.76
68	4.74	8.60	11.83	15.70	18.91	21.00	21.52	20.34	17.70	14.22	10.57	7.63
67	-4.86	-4.93	-2.61	-0.41	2.60	6.32	10.09	15.43	19.20	21.29	21.17	19.02
66	-5.57	-6.15	-6.37	-6.73	-6.56	-5.67	-3.91	-0.97	2.94	7.78	13.02	17.60
65	-3.92	-4.46	-5.30	-6.05	-7.17	-7.62	-7.83	-7.64	-6.39	-5.30	-2.59	1.39
64	[illegible]	-3.91	-4.03	-4.17	[illegible]	-5.59	[illegible]	-7.27	-7.93	-8.22	[illegible]	-7.49
63	[illegible]	-3.13	-4.73	[illegible]	-2.73	-3.70	-3.92	-4.65	-5.60	-6.53	-7.82	-8.40
62	[illegible]	[illegible]	-3.66	[illegible]	[illegible]	-2.73	-3.40	-3.14	[illegible]	-3.34	-5.12	-6.35
61	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	-1.11	-2.33	-2.72	-2.75	-2.72	-3.09	-3.33

[illegible]	30	31	32	33	34	35	36	37	38	39	40	
[illegible]	-1.19	-3.30	-0.29	0.36	1.14	2.07	3.13	4.31	5.57	6.83	8.03	119
[illegible]	-0.15	2.12	0.55	1.13	1.34	2.63	3.47	4.30	5.07	5.71	6.22	118
[illegible]	2.18	2.02	2.11	2.39	2.78	3.19	3.54	3.77	3.86	3.83	3.71	117
[illegible]	6.94	5.83	4.96	4.32	3.63	3.41	2.99	2.56	2.12	1.71	1.37	116
[illegible]	14.17	12.42	10.30	8.13	6.12	4.38	2.95	1.81	0.95	0.32	-0.10	115
[illegible]	18.04	18.1	16.97	14.72	11.84	8.80	6.03	3.73	1.97	0.71	-0.13	114
[illegible]	12.76	15.08	16.96	17.93	17.64	16.08	13.53	10.49	7.45	4.79	2.68	113
[illegible]	4.45	6.20	8.59	11.22	13.99	16.31	17.61	17.52	16.01	13.41	10.30	112
[illegible]	-0.77	-0.20	0.78	2.29	4.42	7.17	10.37	13.64	16.36	17.91	17.87	111
[illegible]	-3.22	-3.14	-2.89	-2.43	-1.67	-0.50	1.21	3.58	6.61	10.12	13.65	110
[illegible]	-4.32	-4.40	-4.38	-4.26	-4.04	-3.68	-3.14	-2.30	-1.03	0.79	3.29	109
[illegible]	-4.38	-4.74	-4.91	-4.95	-4.91	-4.80	-4.62	-4.35	-3.94	-3.33	-2.43	108
[illegible]	-2.12	-3.47	-4.32	-4.80	-5.05	-5.14	-5.13	-5.04	-4.89	-4.65	-4.33	107
[illegible]	6.14	2.58	-1.26	-2.28	-3.61	-4.43	-4.88	-5.10	-5.16	-5.10	-4.95	106
[illegible]	18.85	15.94	11.71	7.20	3.19	0.07	-2.12	-3.54	-4.38	-4.82	-5.00	105
2.96	17.05	21.73	22.91	21.84	18.41	13.57	8.46	3.95	0.49	-1.90	-3.38	104
[illegible]	3.97	8.28	13.52	18.88	23.17	25.14	24.16	20.46	15.10	9.41	4.46	103
[illegible]	-3.32	-2.61	-0.51	2.77	7.36	13.04	19.03	24.00	26.51	25.65	21.64	102
[illegible]	-5.84	-5.87	-5.63	-5.01	-3.82	-1.75	1.55	6.32	12.41	19.02	24.59	101
[illegible]	-6.00	-6.34	-6.56	-6.65	-6.60	-6.34	-5.74	-4.58	-2.52	0.87	5.91	100
[illegible]	-5.27	-5.79	-6.29	-6.60	-6.83	-6.97	-7.02	-6.95	-6.69	-6.09	-4.89	99
[illegible]	-2.56	-3.83	-4.83	-5.60	-6.18	-6.59	-6.88	-7.09	-7.22	-7.25	-7.15	98
7.77	4.69	1.88	-0.50	-2.42	-3.92	-5.03	-5.84	-6.42	-6.83	-7.11	-7.27	97
[illegible]	16.74	13.65	10.03	6.33	2.91	0.01	-2.29	-4.00	-5.21	-6.04	-6.60	96
[illegible]	19.68	21.12	21.03	19.32	16.19	12.14	7.79	3.71	0.29	-2.32	-4.17	95
[illegible]	7.96	11.81	15.71	19.21	21.70	22.53	21.33	18.18	13.64	8.59	3.87	94
[illegible]	-1.98	0.09	2.63	5.82	9.71	14.11	18.47	21.96	23.62	22.75	19.29	93
[illegible]	-5.56	-4.87	-3.90	-2.78	-1.19	1.02	4.08	8.11	12.96	18.11	22.50	92
[illegible]	-6.63	-6.43	-6.08	-5.63	-5.09	-4.41	-3.48	-2.10	-0.05	2.98	7.27	91
[illegible]	-6.47	-6.65	-6.70	-6.58	-6.35	-6.05	-5.63	-5.23	-4.63	-3.83	-2.61	90
[illegible]	-4.19	-5.30	-6.05	-6.46	-6.62	-6.59	-6.42	-6.15	-5.81	-5.44	-5.05	89
[illegible]	2.19	-0.44	-2.61	-4.24	-5.33	-5.99	-6.31	-6.36	-6.21	-5.94	-5.61	88
[illegible]	13.53	10.33	6.71	3.16	0.06	-2.37	-4.10	-5.19	-5.77	-5.95	-5.87	87
[illegible]	19.22	20.01	18.86	16.30	12.58	8.27	4.04	0.42	-2.30	-4.09	-5.10	86
[illegible]	11.81	14.97	18.01	20.47	21.71	21.16	18.54	14.19	8.97	3.96	-0.07	85
[illegible]	1.17	3.47	6.16	9.34	13.03	17.01	20.62	22.81	22.51	19.26	13.76	84
[illegible]	-4.51	-3.29	-1.92	-0.39	1.42	3.77	6.99	11.26	16.26	20.88	23.36	83
[illegible]	-6.94	-6.34	-5.58	-4.70	-3.77	-2.83	-1.76	-0.27	2.13	5.92	11.25	82
[illegible]	-7.27	-7.42	-7.27	-6.36	-6.23	-5.47	-4.71	-4.01	-3.30	-2.32	-0.60	81
[illegible]	-5.23	-6.26	-7.12	-7.48	-7.46	-7.09	-6.47	-5.70	-4.90	-4.20	-3.59	80
[illegible]	-0.02	-2.14	-4.06	-5.62	-6.69	-7.25	-7.34	-7.02	-6.35	-5.49	-4.60	79
[illegible]	8.44	6.06	3.39	0.57	-2.09	-4.29	-5.83	-6.73	-6.98	-6.69	-5.99	78
[illegible]	17.14	15.75	13.91	11.42	8.19	4.45	0.72	-2.46	-4.75	-6.07	-6.53	77
[illegible]	16.39	18.31	19.06	19.18	18.49	16.62	13.28	8.71	3.72	-0.68	-3.84	76
[illegible]	5.45	8.90	12.04	14.73	17.30	18.85	19.96	19.56	16.92	11.98	5.94	75
[illegible]	-4.67	-2.41	0.38	3.48	6.60	9.59	12.56	15.65	18.57	20.14	18.85	74
[illegible]	-8.24	-7.78	-6.72	-5.01	-2.70	-0.02	2.74	5.50	8.51	12.23	16.54	73
[illegible]	-7.56	-8.32	-8.67	-8.46	-7.66	-6.16	-4.08	-1.66	0.76	3.11	5.82	72
[illegible]	-4.57	-5.95	-7.24	-8.22	-8.72	-8.65	-7.92	-6.51	-4.53	-2.33	-0.29	71
[illegible]	-1.21	-2.24	-3.60	-5.17	-6.69	-7.89	-8.57	-8.60	-7.92	-6.55	-4.70	70
[illegible]	3.26	1.90	0.76	-0.54	-2.20	-4.13	-6.02	-7.51	-8.35	-8.43	-7.80	69
[illegible]	14.22	10.67	7.68	5.40	3.55	1.67	-0.55	-3.04	-5.39	-7.17	-8.18	68
[illegible]	21.29	21.17	19.02	15.68	12.24	9.27	6.70	4.07	1.07	-2.16	-5.10	67
[illegible]	7.78	13.02	17.60	20.27	20.48	18.68	15.87	12.91	9.90	6.53	2.58	66
[illegible]	-5.30	-2.59	1.39	6.48	11.68	16.32	18.78	19.14	17.99	16.04	13.43	65
[illegible]	-8.22	-8.09	-7.40	-5.81	-3.02	1.06	6.03	10.99	14.97	17.50	18.75	64
[illegible]	-6.63	-7.62	-8.40	-8.76	-8.65	-7.77	-5.87	-2.82	1.29	5.99	10.54	63
[illegible]	-3.34	-5.72	-6.35	-7.57	-8.54	-9.12	-9.24	-8.71	-7.36	-5.07	-1.80	62
[illegible]	-2.72	-2.99	-3.63	-4.68	-5.98	-7.27	-8.36	-9.05	-9.25	-8.92	-7.98	61

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	12.66	8.44	4.56	1.35	-0.94	-1.27	-2.1
59	6.01	9.29	13.13	17.15	20.63	22.84	23.01	20.09	16.33	11.22	6.62	3.1
58	-3.31	-2.83	-1.65	0.33	3.36	7.33	11.09	16.62	20.40	22.50	22.12	15.7
57	-4.09	-4.55	-5.02	-5.46	-5.73	-5.47	-4.34	-1.39	2.03	7.59	13.79	19.2
56	-4.35	-4.17	-4.25	-4.72	-5.40	-6.29	-6.99	-7.40	-7.22	-6.24	-4.14	-2.4
55	-6.53	-5.91	-5.27	-4.92	-4.57	-4.43	-4.73	-5.36	-6.27	-7.28	-8.11	-8.30
54	-7.32	-7.45	-7.25	-6.84	-6.16	-5.30	-4.36	-4.18	-4.20	-4.57	-5.61	-6.8
53	-1.39	-3.47	-5.15	-6.37	-6.94	-6.92	-6.56	-5.94	-5.05	-4.21	-3.83	-4.2
52	12.78	10.20	6.95	3.41	0.14	-2.55	-4.58	-5.74	-5.99	-5.72	-5.37	-4.9
51	17.20	13.77	19.32	19.06	16.72	13.40	9.25	4.27	1.00	-2.22	-4.55	-5.70
50	6.54	5.52	10.97	13.91	17.17	19.93	21.33	20.91	18.39	13.95	8.46	3.62
49	-0.35	-0.11	0.16	0.33	2.24	4.52	7.77	12.01	16.60	20.27	22.11	21.62
48	-3.32	-2.85	-2.68	-2.77	-3.03	-3.40	-3.49	-2.75	-0.85	2.33	7.15	13.10
47	-6.94	-5.12	-5.37	-4.31	-3.91	-3.73	-3.93	-4.49	-5.20	-5.87	-5.32	-4.4
46	-9.17	-9.02	-6.60	-7.97	-6.92	-5.93	-5.03	-4.33	-4.11	-4.53	-5.35	-6.29
45	-7.05	-9.16	-9.95	-9.33	-9.30	-8.74	-3.27	-7.33	-6.20	-5.26	-4.39	-4.1
44	1.03	-0.92	-3.05	-5.06	-6.76	-8.05	-8.81	-9.06	-3.91	-8.39	-7.49	-6.37
43	10.30	9.99	3.65	6.71	4.25	1.45	-1.37	-3.94	-6.07	-7.62	-8.55	-3.89
42	13.52	13.02	14.12	14.37	15.15	14.66	13.40	11.39	7.31	2.09	3.22	-3.1
41	9.45	9.85	10.25	10.87	11.63	13.16	14.79	16.50	17.31	19.19	17.17	14.6
40	1.36	2.43	3.37	4.31	4.65	5.11	5.39	6.35	7.70	9.87	12.79	15.9
39	-6.07	-5.57	-4.34	-3.07	-1.54	-0.74	0.12	0.61	0.63	0.36	0.29	0.9
38	-9.35	-9.39	-9.53	-9.39	-8.04	-7.01	-5.80	-4.59	-3.35	-2.59	-2.35	-2.7
37	-7.99	-8.85	-9.62	-10.13	-10.39	-10.37	-10.09	-9.58	-8.39	-7.93	-6.78	-5.4
36	-2.92	-3.08	-4.94	-6.08	-7.24	-8.31	-9.17	-9.86	-10.37	-10.69	-10.76	-10.4
35	1.62	1.27	0.35	0.13	-0.34	-1.23	-2.39	-3.39	-5.34	-6.87	-8.34	-9.6
34	7.60	6.32	6.16	5.65	5.30	5.08	4.87	4.49	3.33	2.79	1.32	-0.5
33	16.33	15.46	14.30	13.23	12.09	11.03	10.10	9.39	9.04	9.06	9.24	9.2
32	10.23	11.95	13.00	13.74	14.12	14.21	14.01	13.54	12.87	12.12	11.52	11.3
31	-4.65	-3.37	-1.90	-0.37	1.33	2.91	4.45	5.98	7.45	8.70	9.57	9.9
30	-9.39	-9.82	-9.53	-9.35	-8.99	-8.48	-7.77	-6.87	-5.73	-4.49	-2.94	-1.1
29	-7.00	-7.53	-8.13	-8.55	-9.17	-9.70	-10.17	-10.47	-10.57	-10.53	-10.36	-10.11
28	-3.66	-3.91	-4.23	-4.59	-4.97	-5.42	-5.98	-6.64	-7.33	-8.07	-8.60	-9.0
27	-4.10	-3.73	-3.54	-3.22	-2.99	-2.84	-2.76	-2.73	-2.80	-3.01	-3.37	-3.3
26	-1.35	-2.42	-2.30	-2.06	-2.96	-2.35	-2.75	-2.70	-2.71	-2.65	-2.45	-2.2
25	11.02	9.82	8.70	7.63	6.53	5.39	4.33	3.38	2.53	1.69	0.35	0.0
24	16.92	17.46	17.90	18.27	13.52	13.52	13.19	17.43	15.50	15.61	14.74	13.8
23	2.03	3.27	4.58	5.90	7.19	8.43	9.63	10.87	11.92	12.79	13.32	14.2
22	-6.64	-6.60	-6.58	-6.41	-6.03	-5.63	-5.31	-4.99	-4.64	-4.10	-3.39	-2.4
21	-5.29	-5.58	-5.89	-6.28	-6.67	-7.01	-7.25	-7.45	-7.63	-7.85	-8.05	-8.2
20	-3.93	-4.00	-4.05	-4.06	-4.00	-3.98	-4.11	-4.36	-4.61	-4.90	-4.95	-5.0
19	-6.43	-6.17	-5.95	-5.79	-5.59	-5.32	-5.00	-4.66	-4.40	-4.29	-4.33	-4.3
18	-7.11	-7.40	-7.61	-7.63	-7.55	-7.38	-7.27	-7.22	-7.17	-7.10	-7.01	-6.9
17	0.67	-0.04	-1.30	-1.54	-2.13	-2.65	-2.97	-3.23	-3.51	-3.92	-4.44	-4.9
16	13.23	12.70	12.20	11.80	11.52	11.29	10.95	10.50	9.93	9.34	8.71	8.0
15	11.11	11.71	12.23	12.68	13.15	13.72	14.33	15.00	15.43	15.57	15.41	15.1
14	0.63	0.81	1.08	1.44	1.87	2.35	2.79	3.12	3.37	3.59	3.39	3.9
13	-2.23	-2.27	-2.34	-2.51	-2.71	-2.81	-2.79	-2.72	-2.67	-2.72	-2.96	-3.1
12	-3.23	-3.21	-3.17	-3.11	-3.01	-2.89	-2.32	-2.85	-2.92	-2.97	-3.57	-2.9
11	-5.60	-6.23	-5.14	-6.06	-6.02	-5.95	-5.82	-5.64	-5.44	-5.25	-5.13	-5.0
10	-8.33	-8.67	-8.83	-8.96	-8.79	-8.71	-3.67	-8.70	-8.76	-8.73	-8.69	-8.5
9	-6.10	-6.20	-6.30	-6.59	-6.81	-7.13	-7.39	-7.52	-7.55	-7.53	-7.52	-7.5
8	2.13	1.95	1.55	1.29	1.05	0.84	0.66	0.46	0.22	0.01	-0.13	-0.1
7	9.47	9.86	9.61	9.56	9.39	9.15	8.97	8.95	9.03	9.17	9.29	9.2
6	8.85	8.77	8.73	8.78	8.93	9.13	9.43	9.58	9.57	9.43	9.42	9.4
5	5.04	5.15	5.27	5.33	5.32	5.23	5.26	5.29	5.35	5.51	5.66	5.6
4	1.51	1.47	1.41	1.43	1.53	1.72	1.95	2.12	2.15	2.03	1.90	1.3
3	-4.05	-3.94	-3.81	-3.74	-3.71	-3.71	-3.67	-3.52	-3.44	-3.27	-3.15	-3.1
2	-9.15	-9.12	-9.10	-8.19	-9.15	-8.03	-7.94	-7.80	-7.17	-7.50	-7.35	-8.0
1	-8.67	-8.67	-8.67	-8.67	-8.67	-8.67	-8.57	-8.57	-8.57	-8.67	-8.57	-8.6
	21	22	23	24	25	26	27	28	29	30	31	

	30	31	32	33	34	35	36	37	38	39	40	
[illegible]	[illegible]	-1.37	-2.16	-2.43	-3.01	-4.04	-5.39	-6.80	-8.03	-8.94	-9.44	60
[illegible]	11.29	6.62	3.13	0.93	-0.23	-0.93	-1.75	-3.66	-4.85	-6.62	-5.57	59
[illegible]	22.59	22.92	16.72	14.04	9.59	6.19	3.33	1.98	0.05	-2.33	-5.01	58
[illegible]	7.59	13.79	19.26	22.74	23.34	21.05	17.03	12.79	9.10	5.94	2.83	57
[illegible]	-6.24	-4.14	-0.46	5.22	11.53	17.67	21.30	22.17	20.66	17.97	15.06	56
6.27	-7.28	-8.11	-9.30	-7.52	-5.67	-2.45	2.46	8.40	13.87	17.74	19.69	55
[illegible]	-4.67	-5.01	-6.80	-8.11	-9.41	-10.37	-9.40	-7.29	-3.76	1.07	6.28	54
[illegible]	-4.21	-3.88	-4.28	-5.48	-7.29	-9.04	-10.23	-10.91	-10.77	-9.33	-6.73	53
[illegible]	-5.72	-5.37	-4.59	-4.83	-5.19	-5.98	-7.26	-9.11	-10.61	-11.17	-10.95	52
[illegible]	-2.22	-4.55	-5.70	-5.90	-5.58	-5.02	-4.87	-5.70	-7.10	-8.71	-10.32	51
[illegible]	13.85	8.46	3.62	-0.16	-2.75	-3.96	-4.10	-3.76	-3.35	-4.04	-6.36	50
[illegible]	20.27	22.11	21.62	18.42	13.39	8.36	4.37	1.75	0.64	0.08	-1.02	49
6.35	2.38	7.15	13.10	18.74	22.71	24.46	23.25	19.37	14.49	9.99	6.94	48
[illegible]	-5.87	-5.82	-4.43	-1.52	3.15	9.40	15.65	20.09	22.47	22.38	19.89	47
[illegible]	-4.53	-5.35	-6.35	-7.35	-7.82	-7.21	-5.47	-2.49	2.20	7.89	12.99	46
[illegible]	-5.26	-4.39	-4.12	-4.93	-6.61	-8.47	-10.03	-10.84	-10.51	-9.09	-6.40	45
3.91	-8.39	-7.49	-6.37	-5.42	-5.00	-5.39	-6.81	-8.79	-10.61	-11.83	-12.31	44
[illegible]	-7.62	-8.56	-8.89	-8.59	-7.58	-6.19	-5.21	-5.41	-6.80	-8.78	-10.70	43
[illegible]	2.99	0.22	-3.03	-5.64	-7.28	-8.01	-7.76	-6.62	-5.26	-4.88	-6.07	42
7.31	19.18	17.17	14.65	10.91	6.41	1.70	-2.36	-4.69	-5.02	-4.03	-2.88	41
[illegible]	9.87	12.79	15.96	18.84	20.80	21.07	19.04	14.78	9.17	4.33	2.03	40
[illegible]	0.36	0.29	0.93	2.72	5.99	10.63	16.06	21.16	23.95	22.69	18.69	39
2.35	-2.59	-2.35	-2.73	-3.64	-4.58	-4.93	-4.29	-2.01	2.65	9.01	14.41	38
[illegible]	-7.58	-6.78	-5.46	-4.49	-4.30	-4.95	-6.17	-7.69	-9.12	-9.28	-7.37	37
[illegible]	-10.69	-10.76	-10.40	-9.47	-7.99	-6.36	-5.24	-5.01	-5.94	-8.19	-10.55	36
5.34	-6.87	-3.34	-9.68	-10.76	-11.30	-11.04	-10.06	-8.71	-7.01	-5.31	-5.19	35
3.83	2.79	1.32	-0.53	-2.62	-4.85	-7.16	-9.15	-10.27	-10.61	-10.09	-8.13	34
[illegible]	9.06	9.24	9.29	9.01	8.34	7.18	5.15	2.19	-1.01	-4.14	-7.32	33
[illegible]	12.12	11.52	11.33	11.56	11.99	12.52	13.47	14.80	15.42	14.76	13.08	32
7.45	8.70	9.57	9.98	9.99	9.76	9.33	8.62	7.95	8.37	10.16	12.75	31
[illegible]	-4.49	-2.94	-1.15	0.57	1.92	2.89	3.62	3.96	3.45	2.37	1.42	30
[illegible]	-10.53	-10.38	-10.11	-9.64	-8.83	-7.95	-7.03	-5.96	-4.36	-2.52	-0.98	29
7.33	-9.07	-8.60	-9.01	-9.32	-10.17	-10.79	-11.16	-11.36	-11.48	-11.33	-10.58	28
[illegible]	-3.01	-3.37	-3.35	-4.37	-4.89	-5.56	-6.52	-7.52	-8.26	-8.79	-9.50	27
[illegible]	-2.65	-2.45	-2.21	-2.11	-2.18	-2.27	-2.28	-2.25	-2.37	-2.60	-2.67	26
2.53	1.69	0.85	0.09	-0.43	-0.69	-0.91	-1.25	-1.54	-1.50	-1.11	-0.68	25
6.56	15.61	14.74	13.84	12.80	11.64	10.47	9.42	8.53	7.58	6.47	5.52	24
[illegible]	12.79	13.32	14.24	15.07	15.96	16.68	17.09	17.25	17.41	17.55	17.58	23
[illegible]	-4.10	-3.35	-2.49	-1.62	-0.73	0.22	1.27	2.32	3.23	4.01	4.91	22
7.63	-7.85	-8.09	-8.25	-8.21	-8.02	-7.83	-7.84	-8.05	-8.29	-8.35	-8.17	21
[illegible]	-4.30	-4.95	-5.08	-5.22	-5.41	-5.64	-5.91	-6.24	-6.69	-7.24	-7.77	20
[illegible]	-4.29	-4.33	-4.37	-4.24	-4.00	-3.80	-3.75	-3.94	-4.23	-4.42	-4.40	19
7.17	-7.10	-7.01	-6.91	-6.78	-6.64	-6.51	-6.31	-6.08	-5.92	-5.85	-5.80	18
[illegible]	-3.92	-4.44	-4.92	-5.19	-5.31	-5.41	-5.54	-5.75	-6.07	-6.35	-6.43	17
[illegible]	9.34	8.71	8.05	7.45	6.78	6.09	5.54	5.14	4.75	4.29	3.81	16
5.43	15.57	15.41	15.12	14.96	15.04	15.23	15.46	15.69	15.84	15.99	16.25	15
3.37	3.59	3.30	2.99	4.22	4.59	5.02	5.58	6.27	7.04	7.75	8.31	14
[illegible]	-2.72	-2.96	-3.14	-3.24	-3.11	-2.85	-2.66	-2.57	-2.58	-2.62	-2.61	13
[illegible]	-2.97	-2.97	-2.95	-2.91	-2.89	-2.93	-3.01	-3.07	-3.07	-3.06	-3.11	12
5.44	-5.25	-5.13	-5.07	-5.00	-4.87	-4.67	-4.47	-4.34	-4.29	-4.31	-4.35	11
[illegible]	-8.78	-8.69	-8.52	-8.32	-8.17	-8.09	-8.05	-7.96	-7.84	-7.76	-7.79	10
[illegible]	-7.53	-7.52	-7.57	-7.65	-7.68	-7.64	-7.56	-7.52	-7.61	-7.89	-8.27	9
0.22	0.01	-0.13	-0.18	-0.15	-0.10	-0.15	-0.34	-0.63	-0.96	-1.26	-1.58	8
[illegible]	9.17	9.28	9.26	9.12	8.97	8.86	8.80	8.77	8.74	8.65	8.43	7
[illegible]	9.48	9.42	9.43	9.48	9.56	9.58	9.51	9.41	9.47	9.78	10.21	6
6.35	5.51	5.66	5.65	5.43	5.13	4.93	4.95	5.17	5.50	5.82	5.97	5
2.15	2.08	1.98	1.89	1.84	1.83	1.83	1.80	1.72	1.70	1.87	2.22	4
[illegible]	-3.27	-3.15	-3.16	-3.37	-3.60	-3.73	-3.68	-3.52	-3.34	-3.20	-3.08	3
[illegible]	-7.90	-7.95	-8.01	-8.06	-8.09	-8.09	-8.10	-8.13	-8.16	-8.12	-7.97	2
[illegible]	-8.67	-8.67	-8.67	-8.67	-8.67	-8.67	-8.67	-8.67	-8.67	-8.67	-8.67	1

	41	42	43	44	45	46	47	[illegible]	[illegible]	[illegible]	
119	[illegible]	9.21	10.45	[illegible]	10.61	[illegible]	[illegible]	[illegible]	7.15	[illegible]	
118	6.52	[illegible]	7.06	7.22	7.36	7.44	7.42	7.29	6.02	[illegible]	
117	3.53	3.49	3.49	[illegible]	[illegible]	4.32	4.31	5.32	5.75	6.03	
116	1.13	1.60	[illegible]	1.12	1.79	1.90	2.33	2.67	3.00	4.41	
115	-0.34	-0.45	-0.44	-0.30	-0.13	0.17	0.57	1.06	1.56	2.25	
114	[illegible]	-0.93	-1.04	-1.07	-1.02	-0.73	-0.47	-0.15	0.25	0.73	
113	1.14	0.11	-0.54	-0.90	-1.05	-1.06	-0.95	-0.78	-0.55	-0.25	
112	7.22	4.57	2.51	1.05	0.22	-0.43	-0.77	-0.87	-0.85	-0.71	-
111	15.25	13.51	10.25	7.09	4.42	2.40	1.31	0.14	-0.35	-0.58	-
110	10.54	18.12	17.99	16.18	13.20	9.73	6.57	3.06	2.09	0.86	
109	5.47	10.12	13.72	16.72	16.17	17.72	15.51	12.20	8.55	5.54	
108	-1.11	0.79	3.33	6.71	10.54	14.29	17.05	18.01	16.85	14.01	1
107	-3.37	-7.23	-2.31	-0.92	1.09	3.92	7.55	11.59	15.21	17.35	1
106	-4.75	-4.43	-4.14	-3.61	-3.03	-2.01	-0.43	1.93	5.21	9.19	1
105	-5.01	-4.91	-4.75	-4.54	-4.20	-3.94	-3.41	-2.60	-1.31	0.68	-
104	-4.22	-4.62	-4.75	-4.75	-4.66	-4.59	-4.23	-3.96	-3.30	-2.79	-
103	2.74	-1.72	-3.20	-3.99	-4.36	-4.43	-4.45	-4.31	-4.09	-3.77	-
102	15.75	9.60	4.41	0.67	-1.72	-3.09	-3.79	-4.07	-4.11	-3.93	-
101	27.35	26.27	21.72	15.32	8.91	3.74	0.17	-1.99	-3.12	-3.61	-
100	12.43	17.60	25.37	27.83	25.93	20.59	13.60	7.07	2.18	-0.97	-
99	-2.71	0.65	6.43	13.47	20.65	26.33	27.36	24.47	17.61	10.01	
98	-6.82	-6.12	-4.75	-2.30	1.79	7.89	15.62	23.22	27.69	26.59	2
97	-7.33	-7.27	-7.06	-6.63	-5.89	-4.22	-1.30	3.71	11.15	19.87	2
96	-6.94	-7.13	-7.18	-7.14	-7.02	-6.77	-6.23	-5.25	-3.07	1.17	
95	-5.49	-6.17	-6.60	-6.81	-6.89	-6.39	-6.84	-6.68	-6.30	-5.50	-
94	0.06	-2.69	-4.43	-5.52	-6.10	-6.32	-6.48	-6.43	-6.42	-6.27	-
93	14.61	7.21	3.05	-0.75	-3.24	-4.70	-5.45	-5.81	-5.94	-5.93	-
92	24.66	23.51	19.10	12.94	6.55	1.55	-1.31	-3.76	-4.76	-5.19	-
91	12.34	18.93	23.85	25.37	23.65	17.09	9.92	2.74	-0.43	-2.97	-
90	-1.59	2.79	7.97	14.65	21.36	25.79	25.45	20.12	12.27	5.13	
89	-4.60	-3.69	-2.37	-0.07	4.24	10.71	18.51	24.06	26.11	21.17	1
88	-5.30	-5.03	-4.77	-4.33	-3.48	-1.63	1.90	8.05	16.31	23.09	2
87	-5.64	-5.36	-5.05	-4.86	-4.66	-4.40	-3.82	-2.36	0.96	6.98	1
86	-5.53	-5.61	-5.47	-5.21	-4.92	-4.65	-4.44	-4.20	-3.65	-2.22	
85	-2.52	-4.43	-5.21	-5.43	-5.31	-5.01	-4.65	-4.34	-4.07	-3.76	-
84	7.55	2.14	-1.67	-3.89	-4.92	-5.20	-5.06	-4.71	-4.29	-3.90	-
83	22.16	17.21	10.25	3.79	-0.95	-3.59	-4.73	-5.00	-4.78	-4.36	-
82	17.37	22.25	23.21	19.07	11.60	4.37	-0.75	-3.52	-4.67	-4.89	-
81	2.53	7.53	14.53	21.19	23.63	20.11	12.47	4.70	-0.72	-3.61	-
80	-2.59	-1.62	1.02	5.97	13.35	20.90	24.59	21.47	13.55	5.34	-
79	-3.94	-3.29	-2.75	-1.77	0.59	5.42	13.13	21.61	26.23	23.91	1
78	-5.07	-4.13	-3.35	-2.92	-2.60	-1.91	0.12	4.76	12.35	22.96	2
77	-6.31	-5.64	-4.75	-3.83	-3.28	-3.06	-2.07	-2.09	-1.03	2.73	1
76	-5.64	-6.23	-6.24	-5.65	-4.86	-4.17	-3.02	-3.91	-4.27	-4.42	-
75	0.42	-2.52	-5.72	-6.59	-6.58	-6.10	-5.47	-5.03	-5.04	-5.50	-
74	14.14	7.40	0.98	-2.97	-6.07	-7.07	-7.18	-6.85	-6.44	-6.28	-
73	20.07	20.43	16.31	9.15	1.92	-3.77	-6.23	-7.53	-7.78	-7.69	-
72	9.73	15.09	20.44	22.75	19.88	12.68	4.52	-1.86	-5.63	-7.48	-
71	1.55	3.82	7.65	13.76	21.03	26.39	25.95	19.62	10.43	2.27	-
70	-2.60	-1.21	0.04	1.64	4.95	11.25	20.30	29.05	32.91	29.46	2
69	-6.58	-4.50	-3.47	-2.51	-2.15	-1.69	0.38	5.70	14.38	26.08	3
68	-8.41	-7.96	-7.01	-5.92	-4.91	-4.78	-5.43	-6.09	-5.47	-2.15	
67	-7.28	-8.57	-9.03	-8.86	-8.17	-7.32	-6.90	-7.39	-8.59	-9.80	-1
66	-1.64	-5.40	-8.11	-9.67	-10.22	-10.01	-9.30	-8.52	-8.51	-8.75	-1
65	9.73	4.74	-0.79	-5.53	-8.73	-10.40	-10.86	-10.47	-9.63	-9.14	-
64	19.15	18.39	15.46	9.94	3.05	-3.13	-7.31	-9.44	-10.03	-9.64	-
63	14.60	19.43	22.31	25.24	25.31	20.78	12.59	4.84	-1.45	-5.27	-
62	2.11	6.13	10.12	14.95	21.19	28.27	32.07	32.25	25.93	16.76	
61	-6.34	-4.09	-1.70	0.77	1.93	4.90	10.42	18.09	27.15	32.17	2

[illegible]	50	51	52	53	54	55	56	57	58	59	60	
[illegible]	3.38	4.76	3.75	2.68	2.16	1.59	1.15	0.81	0.57	0.39	0.26	119
[illegible]	[illegible]	5.69	4.89	4.06	3.25	2.52	1.90	1.40	1.00	0.71	0.49	118
[illegible]	6.03	6.18	5.87	5.42	4.77	4.02	3.25	2.53	1.90	1.39	0.99	117
[illegible]	4.41	5.07	5.57	5.83	5.79	5.45	4.37	4.13	3.34	2.59	1.93	116
1.66	3.35	3.13	3.94	4.70	5.33	5.72	5.79	5.53	4.98	4.23	3.41	115
[illegible]	0.73	1.31	2.00	2.78	3.63	4.46	5.19	5.67	5.83	5.61	5.07	114
[illegible]	-0.25	0.11	0.56	1.11	1.78	2.56	3.43	4.32	5.12	5.68	5.90	113
[illegible]	-0.71	-0.31	-0.26	0.07	0.49	1.02	1.67	2.45	3.35	4.28	5.14	112
[illegible]	-0.58	-0.63	-0.57	-0.42	-0.20	0.10	0.49	1.00	1.65	2.44	3.36	111
[illegible]	0.86	0.13	-0.26	-0.41	-0.41	-0.31	-0.11	0.16	0.54	1.03	1.68	110
3.55	5.54	3.18	1.57	0.58	0.04	-0.21	-0.27	-0.20	-0.03	0.23	0.59	109
6.35	14.01	10.39	6.91	4.12	2.17	0.94	0.25	-0.07	-0.17	-0.12	0.03	108
[illegible]	17.35	17.30	15.13	11.64	7.93	4.80	2.55	1.14	0.37	0.00	-0.11	107
[illegible]	9.19	13.24	16.25	17.18	15.67	12.37	8.48	5.08	2.65	1.17	0.39	106
1.31	[illegible]	3.57	7.38	11.62	15.24	16.90	15.36	12.60	8.53	4.97	2.50	105
[illegible]	-2.79	-1.70	0.01	2.62	6.26	10.64	14.70	16.81	15.89	12.42	8.14	104
[illegible]	-2.77	-3.33	-2.71	-1.75	-0.22	2.23	5.86	10.46	14.83	17.01	15.76	103
4.11	-3.93	-3.76	-3.45	-3.04	-2.47	-1.59	-0.14	2.31	6.10	11.00	15.48	102
[illegible]	-3.61	-3.73	-3.64	-3.43	-3.15	-2.78	-2.25	-1.40	0.09	2.72	6.83	101
[illegible]	-0.87	-2.50	-3.22	-3.44	-3.40	-3.22	-2.97	-2.61	-2.09	-1.19	0.46	100
[illegible]	[illegible]	3.68	-0.03	-2.09	-2.98	-3.27	-3.26	-3.10	-2.85	-2.49	-1.92	99
7.69	26.59	20.33	12.00	4.90	0.39	-1.89	-2.85	-3.15	-3.15	-2.99	-2.73	98
[illegible]	19.87	26.59	27.44	21.64	12.75	5.10	0.43	-1.84	-2.76	-3.04	-3.02	97
[illegible]	1.17	3.27	17.68	25.86	27.68	21.76	12.46	4.81	0.34	-1.79	-2.66	96
[illegible]	-5.50	-3.69	0.17	7.25	17.26	26.10	27.70	21.20	11.91	4.64	0.42	95
[illegible]	-6.27	-5.94	-5.19	-3.45	0.46	7.91	18.38	26.90	27.66	20.97	12.13	94
[illegible]	-5.93	-5.83	-5.63	-5.25	-4.44	-2.58	1.57	9.57	19.93	27.73	28.30	93
4.76	-5.19	-5.31	-5.25	-5.09	-4.83	-4.37	-3.44	-1.35	3.13	10.94	20.77	92
[illegible]	-2.37	-4.04	-4.51	-4.62	-4.53	-4.31	-3.99	-3.48	-2.53	-0.50	3.69	91
[illegible]	5.13	0.29	-2.35	-3.57	-4.02	-4.10	-3.99	-3.76	-3.47	-3.08	-2.37	90
[illegible]	21.07	12.68	5.04	0.09	-2.48	-3.60	-3.99	-4.02	-3.89	-3.75	-3.65	89
[illegible]	27.60	25.37	20.06	11.33	3.79	-0.83	-3.09	-4.02	-4.29	-4.31	-4.29	88
[illegible]	6.98	15.52	23.00	24.30	18.38	9.61	2.53	-1.64	-3.65	-4.47	-4.75	87
[illegible]	-2.22	1.09	7.42	16.26	23.55	24.20	17.93	9.36	2.47	-1.69	-3.82	86
4.07	-3.76	-3.13	-1.57	2.04	8.85	18.06	25.44	26.31	20.52	11.98	4.46	85
[illegible]	-3.90	-3.57	-3.21	-2.55	-0.89	2.94	10.04	19.72	28.30	31.25	27.15	84
[illegible]	-4.26	-3.91	-3.54	-3.29	-3.05	-2.54	-1.09	2.43	9.25	19.39	30.30	83
[illegible]	-4.88	-4.65	-4.28	-3.95	-3.76	-3.74	-3.83	-3.75	-2.92	-0.31	5.45	82
[illegible]	-3.61	-4.79	-5.06	-4.95	-4.76	-4.67	-4.78	-5.12	-5.61	-6.00	-5.85	81
[illegible]	5.34	-0.47	-3.65	-5.09	-5.60	-5.73	-5.78	-5.96	-6.37	-7.01	-7.74	80
[illegible]	23.91	16.12	7.33	0.63	-3.38	-5.39	-6.29	-6.70	-7.02	-7.47	-8.11	79
[illegible]	22.06	23.48	28.06	21.16	11.67	3.42	-2.05	-5.11	-6.66	-7.52	-8.18	78
[illegible]	[illegible]	13.64	20.87	30.00	33.27	28.80	19.24	9.09	1.31	-3.57	-6.34	77
[illegible]	-4.42	-3.49	-0.31	6.40	16.82	28.50	36.47	36.60	29.04	17.87	7.42	76
.54	-5.30	-6.20	-6.73	-6.46	-4.48	0.50	9.55	21.91	53.83	40.02	37.59	75
[illegible]	-6.28	-5.58	-7.33	-8.26	-9.02	-9.21	-8.29	-5.28	1.15	11.68	24.73	74
[illegible]	-7.60	-7.45	-7.63	-8.26	-9.15	-10.07	-10.83	-11.26	-11.09	-9.69	-6.01	73
.63	-7.48	-8.12	-8.30	-8.50	-8.98	-9.75	-10.73	-11.62	-12.34	-12.85	-13.07	72
.43	2.27	-3.27	-6.32	-7.77	-8.54	-9.24	-10.08	-11.04	-11.97	-12.79	-13.47	71
[illegible]	29.46	20.68	10.75	2.71	-2.59	-5.72	-7.67	-9.14	-10.46	-11.62	-12.58	70
[illegible]	26.08	34.36	37.06	32.00	22.64	12.82	4.36	-0.90	-5.04	-8.05	-10.21	69
.47	-2.15	4.95	15.50	20.85	34.88	36.51	31.89	23.59	14.39	5.87	-1.18	68
[illegible]	-9.80	-10.11	-8.65	-4.51	2.93	12.93	23.11	30.24	32.47	29.62	22.51	67
[illegible]	-9.25	-10.67	-11.86	-12.42	-12.01	-10.03	-5.79	0.94	9.44	18.31	25.70	66
.63	-9.14	-9.43	-10.47	-11.74	-12.78	-13.35	-13.24	-12.24	-9.97	-6.18	-0.47	65
[illegible]	-9.64	-9.04	-8.96	-9.75	-11.03	-12.27	-13.03	-13.38	-13.12	-12.23	-10.76	64
[illegible]	-5.23	-6.89	-7.31	-7.59	-8.48	-9.96	-11.49	-12.57	-13.12	-12.98	-12.29	63
.93	16.76	7.90	1.45	-2.32	-4.48	-6.38	-8.60	-10.79	-12.56	-13.64	-13.94	62
[illegible]	32.13	21.00	24.38	15.54	7.82	2.51	-1.45	-5.02	-8.39	-11.24	-13.11	61

	41	42	43	44	45	46	47	48	49	50	
60	-9.52	-9.12	[illegible]	[illegible]	[illegible]	-5.02	[illegible]	[illegible]	-2.1[illegible]	4.[illegible]7	1.[illegible]
59	-9.80	-10.73	-11.01	-10.[illegible]	[illegible]	-8.5[illegible]	-8.22	-9.20	-10.72	-1[illegible]	-[illegible]
58	-7.63	-9.72	-11.15	-11.9[illegible]	-11.75	-11.03	-9.68	-8.74	-9.12	-10.5[illegible]	-13.
57	-0.67	-4.21	-7.55	-9.7[illegible]	-11.24	-11.65	-11.79	-9.81	-3.30	-5.52	-[illegible].7
56	12.1[illegible]	5.52	4.60	0.01	-4.15	-7.14	-8.82	-9.30	-8.09	-7.35	-7.[illegible]
55	20.52	21.10	21.21	19.77	16.03	10.27	3.90	-1.0[illegible]	-3.2[illegible]	-6.51	-5.7
54	10.93	14.67	18.02	21.92	25.47	27.42	25.45	19.46	12.9[illegible]	2.79	-2.[illegible]
53	-3.35	-3.03	2.41	4.41	6.91	11.14	17.02	22.67	23.24	22.03	14.1
52	-9.98	-8.56	-6.92	-5.55	-4.91	-4.76	-3.78	-0.40	5.71	14.34	22.0
51	-11.24	-11.30	-10.93	-9.70	-8.54	-7.93	-8.63	-5.66	-9.70	-7.02	-1.[illegible]
50	-8.94	-10.78	-11.55	-11.53	-10.95	-9.45	-8.42	-8.77	-10.21	-11.7[illegible]	-12.[illegible]
49	-2.90	-6.03	-9.12	-10.90	-11.43	-10.60	-8.71	-6.84	-6.55	-8.07	-10.[illegible]
48	5.76	3.93	0.24	-4.15	-7.52	-8.76	-8.64	-7.31	-5.45	-5.47	-5.[illegible]
47	17.02	14.92	14.37	12.73	7.04	0.51	-4.85	-7.78	-7.72	-7.24	-6.1
46	16.15	15.53	16.67	19.36	21.73	19.13	10.93	2.42	-3.32	-7.26	-6.[illegible]
45	-1.72	3.96	6.84	7.24	9.07	16.16	21.20	21.03	15.85	1.60	-2.6
44	-11.27	-5.29	-4.23	-1.91	-3.37	-2.76	1.00	6.24	21.90	20.68	9.[illegible]
43	-11.83	-12.01	-10.00	-7.59	-5.66	-7.20	-9.79	-9.90	-3.33	17.61	17.[illegible]
42	-8.43	-10.82	-12.19	-11.22	-8.73	-6.19	-7.61	-3.21	-13.44	-1.30	2.[illegible]
41	-2.99	-5.12	-8.31	-10.84	-11.04	-8.73	-6.30	-7.14	-12.81	-9.95	-6.[illegible]
40	1.95	2.38	1.32	-3.36	-9.01	-10.09	-8.36	-6.48	-12.03	-13.36	-5.[illegible]
39	14.17	10.47	9.74	10.71	6.00	-2.97	-2.10	-6.95	-7.34	-13.25	-11.[illegible]
38	16.71	15.91	12.89	12.03	18.09	18.22	6.94	-1.96	-3.15	-7.38	-11.
37	-3.71	1.04	5.43	5.23	4.29	12.97	20.99	16.15	7.59	6.06	0.
36	-11.62	-11.10	-8.57	-4.52	-3.39	-5.06	-1.20	3.27	13.00	11.02	14.[illegible]
35	-7.27	-10.14	-12.46	-12.13	-8.33	-6.69	-8.97	-3.51	-3.29	1.27	2.
34	-5.59	-4.65	-6.21	-10.00	-12.69	-10.29	-7.27	-8.45	-10.55	-8.99	-5.
33	-9.13	-8.58	-6.27	-3.77	-6.25	-10.59	-10.69	-7.96	-7.25	-10.01	-10.
32	9.23	3.52	-1.67	-4.86	-2.89	-0.44	-3.91	-8.22	-8.[illegible]	-6.72	-3.
31	16.49	20.05	20.90	17.57	9.66	4.90	4.99	5.95	1.53	-4.09	-5.
30	0.61	0.92	4.23	9.54	18.53	20.47	16.26	12.01	12.57	14.55	9.
29	0.15	0.72	-1.52	-3.98	-6.25	-3.39	3.71	9.52	10.20	9.32	13.
28	-9.40	-9.13	-5.53	-2.74	-0.73	-2.34	-6.83	-5.08	-7.33	-1.72	0.
27	-10.29	-10.79	-11.46	-12.57	-12.25	-10.74	-4.96	-1.21	-2.70	-7.89	-11.
26	-2.89	-3.76	-5.47	-6.75	-3.11	-9.16	-10.80	-14.19	-12.20	-5.96	-2.
25	-0.52	-0.30	0.01	-0.12	-0.50	-0.84	-1.46	-0.84	-0.18	-7.30	-13.
24	4.82	4.04	2.94	1.56	1.42	0.99	1.83	2.98	2.01	2.34	10.
23	17.26	16.50	15.33	15.17	14.09	12.59	11.91	9.53	7.76	8.04	3.
22	6.23	7.98	9.65	10.34	12.00	13.01	14.30	14.63	16.52	16.89	13.
21	-7.80	-7.42	-6.93	-6.16	-5.32	-4.66	-4.06	-2.63	-1.64	-0.93	0.
20	-8.03	-8.06	-7.88	-7.94	-8.21	-8.67	-8.76	-8.76	-9.45	-9.2[illegible]	-8.
19	-4.23	-4.08	-4.08	-4.17	-4.28	-4.21	-4.64	-5.24	-5.32	-5.21	-5.
18	-5.63	-5.25	-4.83	-4.[illegible]	-4.29	-4.53	-4.76	-4.52	-3.66	-4.17	-3.
17	-6.27	-6.13	-6.13	-6.04	-6.73	-7.02	-6.89	-6.52	-6.20	-6.37	-5.
16	3.30	3.01	2.61	2.13	1.52	0.79	-0.05	-0.79	-1.23	-1.19	-3.
15	16.63	16.91	16.76	16.12	15.15	14.24	13.74	13.72	13.98	14.02	13.
14	8.67	8.81	8.78	8.79	9.03	9.31	9.80	10.47	11.25	12.10	13.
13	-2.56	-2.57	-2.67	-2.78	-2.72	-2.68	-2.33	-1.91	-1.12	-0.64	-0.
12	-3.28	-3.57	-3.85	-3.89	-3.65	-3.39	-3.01	-2.87	-2.97	-3.44	-4.
11	-4.35	-4.32	-4.29	-4.15	-3.92	-3.66	-3.45	-3.26	-3.07	-3.03	-3.
10	-7.91	-8.08	-8.21	-8.18	-7.93	-7.48	-6.98	-6.56	-6.33	-6.32	-6.
9	-8.59	-8.77	-8.82	-8.78	-8.62	-8.35	-8.00	-7.74	-7.74	-7.95	-8.
8	-1.88	-2.15	-2.39	-2.57	-2.58	-2.32	-1.86	-1.50	-1.64	-2.26	-3.
7	8.19	8.04	8.02	8.09	8.20	8.31	8.43	8.43	8.13	7.57	7.
6	10.49	10.46	10.24	10.02	9.92	9.89	9.92	9.98	10.00	10.16	10.
5	5.89	5.69	5.60	5.71	5.87	5.81	5.50	5.12	4.93	5.07	5.
4	2.58	2.74	2.63	2.36	2.07	1.86	1.77	1.77	1.85	2.00	2
3	-2.93	-2.73	-2.67	-2.66	-2.78	-2.94	-3.11	-3.26	-3.36	-3.40	-3.
2	-7.74	-7.53	-7.47	-7.61	-7.87	-8.08	-8.13	-8.03	-7.93	-7.91	-7.
1	-8.67	-8.67	-8.67	-8.67	-8.67	-8.67	-8.67	-8.67	-8.67	-8.67	-8
	41	42	43	44	45	46	47	48	49	50	

	50	51	52	53	54	55	56	57	58	59	60	
[illegible]	4.77	14.34	22.68	27.06	25.24	19.42	12.99	7.40	2.45	-2.33	-6.37	60
[illegible]	-10.54	-3.71	-4.11	3.71	13.07	19.96	21.82	19.32	14.99	9.82	3.69	59
[illegible]	-10.59	-12.00	-12.57	-11.67	-8.14	-1.36	7.43	14.86	18.43	16.32	16.18	58
[illegible]	-5.52	-9.79	-11.52	-13.03	-13.62	-12.60	-8.89	-2.28	5.69	12.77	19.98	57
[illegible]	-7.35	-7.47	-9.47	-10.60	-12.34	-14.48	-14.56	-13.06	-9.04	-4.25	0.29	56
[illegible]	-6.61	-6.73	-6.23	-6.85	-8.59	-11.78	-13.85	-14.50	-13.24	-10.70	-10.97	55
[illegible]	2.79	-2.37	-4.98	-4.96	-4.78	-6.53	-9.16	-10.94	-10.68	-7.79	-7.85	54
[illegible]	22.53	14.17	4.74	-1.48	-3.27	-3.32	-5.55	-7.76	-8.65	-5.47	-3.03	53
[illegible]	14.34	22.05	23.34	15.62	6.01	0.89	-2.36	-5.95	-8.99	-7.68	-3.98	52
[illegible]	-7.62	-1.63	9.70	21.79	22.48	16.17	10.61	0.80	-8.07	-10.09	-7.55	51
[illegible]	-11.79	-12.64	-11.10	-2.11	12.01	18.25	28.01	22.90	-1.21	-9.99	-9.18	50
[illegible]	-8.07	-10.36	-13.21	-13.07	-4.96	-0.99	11.56	42.92	19.91	-4.01	-7.87	49
[illegible]	-5.47	-6.72	-10.63	-14.05	-8.65	-7.94	-9.45	21.89	35.64	14.40	1.59	48
7.72	-7.24	-6.18	-9.55	-13.87	-8.50	-6.71	-12.01	1.25	16.79	21.71	19.53	47
[illegible]	-7.26	-6.03	-6.57	-13.76	-9.63	-7.72	-12.95	-5.76	-1.78	1.93	11.86	46
[illegible]	1.60	-2.63	-3.59	-13.21	-10.62	-9.23	-13.73	-8.78	-7.55	-8.76	-7.33	45
1.90	20.63	9.98	6.52	-9.02	-9.07	-8.43	-12.57	-9.72	-8.98	-10.55	-12.80	44
[illegible]	17.61	17.48	30.83	8.28	-2.47	-3.76	-8.46	-8.80	-8.59	-10.00	-12.98	43
[illegible]	-1.30	2.41	17.92	26.30	12.94	8.78	5.44	-1.54	-5.21	-8.21	-11.37	42
[illegible]	-7.95	-6.09	-6.19	3.76	9.38	9.87	15.60	15.14	8.85	0.92	-3.96	41
2.03	-13.36	-3.50	-10.32	-11.33	-7.28	-3.99	-0.95	6.33	11.66	12.65	12.42	40
[illegible]	-13.25	-10.94	-8.92	-11.93	-12.09	-9.78	-9.16	-8.06	-5.79	0.86	7.93	39
[illegible]	-7.38	-11.14	-9.98	-9.86	-11.19	-11.34	-10.22	-10.06	-10.05	-8.81	-6.22	38
[illegible]	6.06	0.39	-5.06	-6.52	-7.51	-9.46	-10.15	-9.93	-9.36	-9.44	-9.33	37
[illegible]	11.02	14.98	14.47	3.94	4.45	0.86	-4.04	-7.10	-8.16	-8.64	-9.22	36
[illegible]	1.27	2.55	7.85	15.31	16.15	15.54	13.98	8.90	2.04	-2.56	-5.73	35
0.55	-8.89	-5.72	-6.28	-4.64	0.80	5.74	9.69	14.65	16.44	13.11	8.33	34
[illegible]	-10.01	-10.43	-8.32	-5.69	-9.75	-8.05	-5.45	-3.41	0.81	5.72	10.20	33
[illegible]	-6.72	-3.63	-10.27	-9.50	-8.57	-9.91	-9.77	-8.99	-8.06	-6.96	-4.63	32
1.53	-4.09	-5.65	-6.02	-3.36	-9.17	-8.84	-8.38	-9.36	-8.95	-8.28	-8.11	31
2.57	14.55	9.44	4.29	1.40	-1.21	-4.72	-5.70	-6.08	-7.14	-7.25	-7.85	30
[illegible]	9.32	13.65	18.04	18.47	16.67	15.24	10.63	7.28	3.90	0.67	-2.15	29
[illegible]	-1.72	0.83	1.78	6.46	11.01	13.94	15.75	15.49	17.00	14.54	12.76	28
2.76	-7.89	-11.12	-7.99	-6.06	-5.54	-5.10	-2.30	-0.87	1.39	4.13	8.05	27
[illegible]	-5.96	-2.72	-5.51	-10.08	-8.57	-7.82	-8.55	-8.43	-7.88	-6.08	-7.12	26
[illegible]	-7.30	-13.25	-12.73	-3.88	-7.59	-9.07	-8.03	-6.70	-8.95	-7.35	-8.07	25
2.01	2.34	10.05	9.32	1.89	-6.21	-7.34	-8.63	-8.75	-8.92	-6.78	-6.69	24
7.76	8.04	3.96	-1.54	3.31	11.16	19.47	12.52	12.65	7.34	0.43	-2.90	23
[illegible]	16.80	13.68	19.47	24.12	12.81	7.63	1.85	7.40	11.05	15.18	24.44	22
1.04	-0.53	0.56	3.31	2.08	3.13	14.37	21.19	17.85	14.03	5.23	1.10	21
[illegible]	[illegible]	-8.37	-8.52	-9.28	-6.95	-3.55	-10.09	-11.62	-4.59	2.84	7.51	20
[illegible]	-5.21	-5.39	-6.37	-6.96	-6.91	-9.64	-13.26	-11.36	-5.29	-10.10	-13.37	19
[illegible]	-2.17	-3.47	-3.37	-3.71	-3.94	-4.87	-4.13	1.36	-1.34	-7.28	-6.09	18
[illegible]	-6.07	-5.37	-4.38	-4.83	-4.90	-4.86	-4.33	-4.95	-3.87	-6.55	-0.29	17
[illegible]	-1.19	-0.92	-1.40	-2.24	-2.96	-4.13	-4.93	-6.25	-7.51	-3.26	0.26	16
[illegible]	14.02	13.66	13.06	12.53	11.94	11.01	10.92	11.13	11.30	13.00	9.37	15
1.25	12.10	13.03	14.21	15.07	15.22	15.71	16.67	16.97	16.74	15.82	14.05	14
[illegible]	-0.64	-0.64	-0.65	-0.66	-0.57	-0.28	-0.03	0.03	0.68	1.39	2.09	13
[illegible]	-3.44	-4.14	-4.72	-4.66	-4.72	-4.71	-4.66	-4.08	-3.19	-2.96	-3.37	12
[illegible]	-3.03	-3.22	-3.53	-3.85	-3.99	-3.82	-3.07	-1.96	-1.71	-2.53	-3.22	11
[illegible]	-6.32	-6.54	-6.37	-7.18	-7.22	-6.75	-5.99	-5.67	-6.19	-6.65	-6.06	10
[illegible]	-7.95	-8.25	-8.56	-8.91	-9.21	-9.26	-9.19	-9.25	-9.16	-8.44	-7.47	9
[illegible]	-2.26	-3.00	-3.67	-4.26	-4.72	-4.83	-4.59	-4.23	-3.69	-3.14	-3.46	8
.13	7.57	7.03	6.72	6.61	6.71	7.06	7.42	7.35	6.98	6.46	5.67	7
	10.10	10.35	10.57	10.70	10.84	11.09	11.19	10.83	10.29	10.09	10.09	6
[illegible]	5.07	5.44	5.81	6.02	6.26	6.63	6.35	6.69	6.29	5.88	5.30	5
[illegible]	2.00	2.17	2.22	2.49	2.76	3.06	3.10	2.86	2.58	2.26	1.76	4
	-3.40	-3.32	-3.09	-2.66	-2.10	-1.64	-1.55	-1.81	-2.12	-2.41	-2.83	3
	-7.91	-7.95	-7.94	-7.78	-7.49	-7.25	-7.25	-7.51	-7.77	-7.91	-8.00	2
	-8.67	-8.67	-8.67	-8.67	-8.67	-8.67	-8.67	-8.67	-8.67	-8.67	-8.67	1

	61	62	63	64	65	66	67	68	69	70	71
119	0.13	0.12	[illegible]	0.05	0.03	0.02	0.01	0.01	0.00	0.00	0.0
118	0.35	0.22	0.14	0.08	0.06	0.04	0.02	0.01	0.01	0.01	0.0
117	0.69	0.47	0.31	0.20	0.13	0.08	0.05	0.03	0.02	0.01	0.0
116	1.39	0.98	0.67	0.45	0.29	0.19	0.12	0.07	0.05	0.03	0.0
115	2.63	1.93	1.37	0.95	0.63	0.42	0.27	0.17	0.10	0.06	0.0
114	4.30	3.44	2.61	1.90	1.32	0.89	0.59	0.38	0.24	0.15	0.0
113	5.71	5.15	4.23	3.42	2.55	1.81	1.24	0.82	0.53	0.33	0.2
112	5.77	6.02	5.82	5.20	4.31	3.34	2.44	1.70	1.14	0.74	0.4
111	4.35	5.27	5.94	6.19	5.92	5.21	4.24	3.21	2.30	1.57	1.0
110	2.49	3.46	4.51	5.49	6.17	6.37	6.00	5.18	4.13	3.06	2.1
109	1.09	1.75	2.61	3.64	4.76	5.77	6.43	6.54	6.05	5.11	3.9
108	0.29	0.65	1.15	1.87	2.78	3.89	5.06	6.09	6.69	6.68	6.0
107	-0.06	0.09	0.35	0.73	1.27	2.03	3.00	4.17	5.39	6.40	6.9
106	0.03	-0.07	-0.02	0.15	0.42	0.82	1.40	2.20	3.24	4.46	5.7
105	1.07	0.34	0.03	-0.05	0.02	0.16	0.43	0.91	1.53	2.37	3.4
104	4.57	2.12	0.90	0.25	-0.01	-0.06	0.03	0.22	0.52	0.97	1.6
103	11.91	7.51	4.06	1.89	0.70	0.14	-0.03	-0.10	0.00	0.20	0.5
102	17.70	15.44	11.23	6.85	3.58	1.59	0.51	0.01	-0.17	-0.15	-0.0
101	11.97	16.27	17.49	15.04	10.62	6.32	3.19	1.31	0.32	-0.13	-0.2
100	3.35	7.78	12.99	16.95	17.61	14.80	10.25	5.96	2.89	1.08	0.1
99	-0.91	0.93	4.07	8.66	13.84	17.59	17.93	14.90	10.15	5.74	2.6
98	-2.33	-1.69	-0.58	1.30	4.62	9.32	14.63	18.47	18.77	15.37	10.2
97	-2.95	-2.56	-2.13	-1.48	-0.37	1.57	4.91	9.86	15.07	19.73	19.9
96	-2.93	-2.90	-2.72	-2.44	-2.05	-1.40	-0.45	1.49	5.00	10.38	16.7
95	-1.65	-2.54	-2.85	-2.93	-2.70	-2.51	-2.25	-1.77	-0.80	1.21	4.9
94	5.17	0.92	-1.30	-2.34	-2.76	-2.80	-2.90	-2.85	-2.69	-2.27	-1.2
93	22.30	14.01	6.91	2.14	-0.61	-2.36	-2.73	-3.14	-3.31	-3.34	-3.2
92	28.52	30.36	25.97	18.21	10.40	4.39	0.50	-1.73	-2.90	-3.49	-3.7
91	10.83	20.21	29.02	32.60	31.90	25.12	16.12	7.96	2.21	-1.22	-2.9
90	-1.76	2.04	8.76	17.78	28.21	36.66	39.29	34.51	24.44	13.44	4.9
89	-3.54	-3.20	-2.17	0.27	5.12	13.37	24.98	37.40	45.33	45.22	35.4
88	-4.34	-4.48	-4.61	-4.58	-4.09	-2.59	0.84	7.66	19.10	34.67	49.3
87	-4.39	-5.07	-5.33	-5.62	-5.86	-5.98	-5.83	-5.11	-3.05	1.32	11.7
86	-4.83	-5.35	-5.73	-6.08	-6.41	-6.69	-6.93	-7.11	-7.23	-7.12	-6.2
85	-0.64	-3.59	-5.20	-6.11	-6.70	-7.11	-7.41	-7.65	-7.89	-8.20	-8.5
84	18.51	9.25	1.98	-2.75	-5.46	-6.92	-7.71	-8.14	-8.43	-8.68	-9.0
83	37.44	37.10	29.35	17.03	7.17	-0.57	-5.15	-7.52	-8.65	-9.22	-9.6
82	15.30	23.38	40.02	47.04	43.46	31.61	16.92	4.50	-3.32	-7.52	-9.3
81	-4.40	-0.41	7.63	20.77	37.25	51.72	57.21	49.91	33.35	15.32	1.7
80	-6.39	-3.70	-8.27	-6.23	-1.23	9.91	25.77	46.74	64.21	68.61	56.3
79	-8.83	-9.68	-10.43	-11.04	-11.40	-11.13	-9.16	-3.20	9.59	31.40	53.4
78	-8.85	-9.69	-10.56	-11.43	-12.29	-13.13	-14.11	-14.94	-15.12	-13.17	-6.0
77	-7.96	-9.12	-10.14	-11.12	-12.09	-13.10	-14.18	-15.37	-16.60	-18.05	-19.2
76	-1.26	-5.05	-8.09	-9.91	-11.32	-12.51	-13.66	-14.85	-16.24	-17.75	-19.3
75	23.18	16.15	5.30	-2.63	-7.73	-10.80	-12.75	-14.28	-15.73	-17.34	-19.0
74	36.12	41.06	37.25	26.49	13.06	1.25	-6.94	-11.85	-14.84	-17.34	-19.1
73	1.20	12.35	25.93	37.71	42.41	36.95	23.27	7.87	-4.21	-11.90	-16.6
72	-12.73	-11.21	-7.40	0.21	12.55	28.11	41.12	44.11	34.73	18.56	3.3
71	-14.35	-14.50	-14.80	-14.65	-13.35	-9.30	-0.27	14.82	32.22	43.28	41.5
70	-13.34	-13.96	-14.50	-15.05	-15.64	-16.21	-16.29	-14.68	-9.12	2.47	13.9
69	-11.66	-12.65	-13.30	-13.79	-14.20	-14.73	-15.44	-16.29	-16.93	-16.52	-13.3
68	-6.41	-9.34	-11.91	-13.10	-13.79	-14.23	-14.69	-15.31	-16.21	-17.40	-18.7
67	12.94	3.17	-4.44	-9.40	-12.32	-13.91	-14.85	-15.52	-16.20	-17.19	-18.6
66	29.19	26.42	17.95	7.20	-1.75	-7.65	-10.39	-12.61	-13.54	-14.24	-15.2
65	7.53	16.89	24.24	25.26	18.59	7.99	-1.13	-6.64	-9.26	-10.42	-11.4
64	-3.45	-4.38	2.40	11.83	20.86	22.92	15.05	2.54	-6.29	-9.61	-10.7
63	-11.24	-9.51	-7.76	-4.22	2.89	14.56	26.76	26.26	7.01	-6.41	-10.5
62	-13.64	-12.99	-11.87	-11.10	-10.37	-6.82	3.38	27.81	39.82	12.67	-7.0
61	-14.04	-14.25	-13.93	-13.39	-14.76	-16.25	-17.34	-19.39	27.39	40.34	10.3

70	71	72	73	74	75	76	77	78	79	80	
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	119
0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	118
0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	117
0.03	0.02	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	116
0.06	0.04	0.02	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	115
0.15	0.09	0.05	0.03	0.02	0.01	0.01	0.00	0.00	0.00	0.00	114
0.33	0.21	0.13	0.08	0.05	0.03	0.02	0.01	0.01	0.00	0.00	113
0.74	0.47	0.29	0.18	0.11	0.06	0.04	0.02	0.01	0.01	0.00	112
1.57	1.03	0.66	0.41	0.25	0.15	0.09	0.05	0.03	0.02	0.01	111
3.06	2.15	1.44	0.93	0.58	0.36	0.22	0.13	0.08	0.04	0.03	110
5.11	3.99	2.90	1.99	1.31	0.83	0.51	0.31	0.18	0.11	0.06	109
6.68	6.06	5.02	3.82	2.71	1.82	1.17	0.72	0.44	0.26	0.15	108
6.40	6.94	6.31	6.05	4.89	3.62	2.50	1.63	1.02	0.62	0.37	107
4.46	5.71	6.72	7.19	6.92	5.99	4.70	3.37	2.26	1.43	0.87	106
2.37	3.46	4.75	6.05	7.06	7.42	6.97	5.84	4.41	3.05	1.97	105
0.97	1.60	2.48	3.65	5.04	6.42	7.40	7.60	6.90	5.55	4.02	104
0.20	0.50	0.95	1.61	2.57	3.86	5.38	6.82	7.71	7.65	6.64	103
-0.18	-0.07	0.12	0.42	0.88	1.61	2.69	4.14	5.80	7.24	7.92	102
-0.13	-0.29	-0.25	-0.19	-0.01	0.30	0.83	1.67	2.91	4.54	6.30	101
1.0[illegible]	0.15	-0.27	-0.41	-0.42	-0.34	-0.14	0.22	0.85	1.84	3.30	100
5.74	2.67	0.89	-0.01	-0.41	-0.56	-0.57	-0.46	-0.21	0.25	1.03	99
15.37	10.25	5.60	2.45	0.66	-0.19	-0.56	-0.69	-0.66	-0.49	-0.15	98
19.73	19.95	16.06	10.37	5.39	2.15	0.42	-0.38	-0.70	-0.76	-0.67	97
10.38	16.71	21.30	21.22	16.69	10.27	4.94	1.69	0.08	-0.58	-0.80	96
1.21	4.57	10.94	18.05	23.07	22.62	16.89	9.58	4.05	1.03	-0.29	95
-2.27	-1.29	0.83	4.05	11.63	19.65	24.95	23.44	16.07	8.00	2.75	94
-3.34	-3.21	-2.79	-1.78	0.48	5.06	12.77	21.93	26.91	23.12	13.73	93
-3.49	-3.76	-3.83	-3.69	-3.24	-2.16	0.37	5.79	15.10	25.27	28.22	92
-1.22	-2.99	-3.82	-4.14	-4.17	-4.01	-3.54	-2.33	0.76	7.75	19.32	91
13.44	4.92	-0.24	-2.83	-3.96	-4.36	-4.42	-4.26	-3.72	-2.20	2.12	90
[illegible]5.22	[illegible]5.41	21.44	9.23	1.48	-2.39	-4.01	-4.55	-4.64	-4.43	-3.69	89
34.67	49.26	53.43	48.34	31.97	15.11	3.63	-1.95	-4.09	-4.70	-4.75	88
[illegible].33	11.78	28.29	48.58	63.27	61.83	44.00	21.42	5.53	-1.81	-4.24	87
-7.12	-6.26	-3.34	4.27	19.98	44.34	68.62	75.11	55.77	26.16	5.82	86
-8.20	-8.56	-8.92	-3.95	-7.60	-2.27	11.97	39.94	74.65	88.95	64.66	85
-9.68	-9.02	-9.82	-10.16	-10.83	-11.32	-11.01	-7.48	5.80	38.82	86.17	84
-9.22	-9.62	-10.05	-10.59	-11.26	-12.10	-13.03	-13.97	-14.46	-12.23	1.31	83
-7.52	-9.32	-10.51	-11.18	-11.90	-12.77	-13.76	-14.88	-16.15	-17.66	-19.07	82
15.32	1.75	-6.14	-10.07	-12.09	-13.40	-14.59	-15.84	-17.24	-18.83	-20.73	81
[illegible]8.61	56.39	34.57	13.00	-1.31	-9.83	-13.81	-16.05	-17.77	-19.45	-21.40	80
1.40	53.40	79.21	81.28	62.40	33.46	8.27	-7.06	-14.40	-17.86	-20.10	79
-13.17	-6.06	10.62	39.25	73.62	96.86	92.74	62.94	26.19	-1.09	-13.94	78
-8.05	-19.27	-19.70	-17.53	-8.49	13.78	51.95	94.72	117.94	98.62	34.93	77
-7.75	-19.30	-20.66	-22.55	-24.18	-25.08	-22.63	-10.74	20.33	94.60	173.71	76
-17.34	-19.07	-20.88	-22.74	-24.71	-26.98	-29.84	-33.78	-39.84	-43.92	31.82	75
-17.04	-19.12	-21.27	-23.53	-25.90	-28.55	-31.69	-35.85	-42.64	-54.64	-54.33	74
-1.90	-16.61	-19.94	-22.79	-25.49	-28.22	-31.04	-34.15	-38.34	-46.92	-58.45	73
[illegible]8.56	3.31	-7.94	-14.30	-18.64	-21.55	-23.75	-25.60	-27.70	-36.99	-47.99	72
43.28	41.55	29.05	12.94	-1.01	-10.06	-15.01	-18.11	-20.50	-31.69	-41.17	71
2.47	13.92	33.88	39.68	30.65	8.51	-8.84	-14.99	-16.85	-28.50	-36.30	70
-6.52	-13.37	-5.26	10.05	35.92	47.25	13.36	-8.89	-14.09	-26.09	-32.27	69
-17.40	-18.70	-19.64	-19.99	-11.36	36.43	55.28	8.85	-11.10	-24.30	-29.00	68
-7.19	-19.66	-20.55	-24.47	-30.57	-16.59	53.37	45.72	-4.05	-23.12	-26.64	67
-4.24	-15.23	-16.45	-20.17	-28.64	-32.58	8.15	70.61	14.48	-21.60	-24.86	66
-10.42	-11.40	-12.27	-15.49	-24.85	-31.69	-22.43	70.45	47.45	-17.61	-22.94	65
-9.61	-10.79	-10.82	-12.81	-21.90	-29.02	-31.51	35.89	80.95	-7.49	-20.56	64
[illegible]5.41	-10.58	-10.47	-11.26	-19.32	-26.39	-30.31	2.48	58.98	13.48	-16.55	63
[illegible].07	-7.01	-10.28	-10.06	-17.71	-24.29	-26.82	-13.00	62.32	36.95	-7.59	62
[illegible]6.24	10.37	-7.67	-11.08	-17.25	-23.08	-23.97	-15.07	29.86	36.57	2.23	61

	61	62	63	64	65	66	67	68	69	70	71
60	-3.65	-10.17	-10.23	-10.14	-11.13	-13.62	[illegible]	-22.09	-12.4[illegible]	3[illegible]	42.[illegible]
59	-1.94	-5.47	-6.59	-[illegible].34	-5.77	-7.2[illegible]	-13.25	-21.2[illegible]	-22.24	-1.[illegible]	20.27
58	[illegible]	-1.19	-7.16	-[illegible]	-6.91	-5.44	-9.31	-16.92	-22.14	-15.[illegible]	23.37
57	26.35	12.81	9.26	-9.05	-10.06	-7.35	-9.21	-15.42	-17.34	-16.72	-3.19
56	12.09	24.09	27.74	-0.63	-10.30	-9.40	-10.75	-15.91	-17.33	-15.27	-4.04
55	-12.14	2.63	39.28	27.23	-2.02	-8.32	-11.53	-16.24	-17.24	-14.57	-10.01
54	-14.04	-16.62	6.81	47.71	21.49	-1.41	-9.79	-15.22	-16.12	-17.33	-9.87
53	-9.57	-16.21	-12.01	16.46	40.26	20.41	-2.25	-12.10	-13.30	-11.71	-3.70
52	-5.64	-14.44	-13.43	-4.61	20.30	38.87	17.12	-3.23	-9.47	-9.34	-7.66
51	-11.46	-15.56	-13.55	-9.65	-6.77	21.01	26.82	11.57	2.00	-2.34	-4.22
50	-13.64	-16.86	-14.01	-10.73	-6.09	1.26	7.07	7.75	9.86	10.72	6.57
49	-13.99	-16.54	-13.17	-10.47	-7.95	-4.69	-6.90	-8.53	-2.86	3.14	15.17
48	-10.94	-14.11	-10.59	-8.95	-6.05	-5.34	-10.14	-13.37	-11.24	-4.24	6.10
47	1.94	-5.24	-3.92	-3.89	-3.90	-7.22	-11.59	-13.57	-11.53	-7.49	-1.73
46	11.09	11.34	13.06	9.42	1.65	-6.20	-12.26	-13.10	-10.51	-6.83	-2.02
45	-7.12	6.90	19.27	24.77	16.83	1.77	-9.40	-10.38	-8.17	-4.63	-1.78
44	-12.12	-6.50	1.28	10.63	14.87	10.27	3.90	-0.28	-1.23	-0.63	-1.65
43	-12.24	-9.07	-6.67	-5.73	-4.27	-0.45	6.84	12.65	14.50	10.91	2.22
42	-13.73	-9.09	-8.22	-9.46	-11.31	-9.95	-3.91	5.69	15.54	16.91	10.13
41	-5.89	-7.05	-7.97	-10.47	-11.68	-10.41	-6.90	-2.98	-0.51	-0.13	1.32
40	5.03	3.39	-3.30	-9.30	-9.40	-8.24	-6.25	-5.40	-7.28	-9.30	-9.57
39	14.06	15.36	10.09	4.20	0.53	-1.71	-3.53	-6.35	-3.02	-10.02	-9.62
38	-2.41	1.64	5.81	11.08	14.03	12.43	6.64	-0.83	-5.27	-8.29	-7.91
37	-0.23	-3.65	-6.44	-2.78	1.95	6.93	10.43	11.09	8.26	3.80	0.17
36	-9.74	-9.70	-9.24	-8.62	-7.71	-6.16	-3.03	2.73	10.85	16.51	16.95
35	-7.44	-6.23	-2.67	-0.81	-3.79	-8.55	-7.65	-6.02	-3.27	0.32	6.39
34	3.56	3.53	-2.45	-4.91	-6.89	-7.73	-7.67	-7.55	-7.55	-7.48	-5.87
33	12.34	14.12	14.07	11.65	6.32	-0.02	-4.84	-7.33	-8.00	-7.71	-7.75
32	-1.11	3.13	8.33	12.79	15.51	14.54	9.93	3.57	-1.10	-3.42	-5.38
31	-7.62	-7.27	-6.21	-4.60	-2.35	1.66	7.96	16.18	20.59	16.06	7.03
30	-8.09	-8.13	-8.51	-8.74	-8.77	-7.91	-5.85	-0.67	6.29	10.05	10.49
29	-4.95	-6.56	-7.90	-8.23	-3.37	-8.72	-7.76	-7.11	-7.20	-7.01	-4.49
28	8.92	5.95	1.20	-2.32	-4.35	-6.07	-6.43	-7.01	-7.27	-7.57	-7.71
27	11.99	13.66	18.43	17.81	16.63	11.92	7.37	1.14	-2.57	-6.35	-7.26
26	-3.15	-0.60	2.85	8.90	13.17	17.09	16.23	16.02	11.51	8.14	3.45
25	-7.33	-7.52	-7.35	-5.97	-6.43	-4.43	-2.96	1.14	6.53	13.04	18.30
24	-7.12	-5.73	-6.10	-0.23	-5.90	-8.95	-8.45	-8.43	-5.22	-3.44	1.23
23	-6.83	-5.03	-6.32	-5.99	-7.37	-9.14	-8.04	-7.95	-6.00	-5.53	-7.42
22	16.33	11.35	4.35	-1.47	-2.03	-3.85	-3.81	-4.24	-4.09	-4.74	-7.99
21	3.07	10.39	21.99	27.05	21.74	16.10	13.64	13.83	8.07	3.05	-3.05
20	11.57	3.29	-0.57	-2.61	4.25	10.83	13.85	19.67	19.08	16.59	15.52
19	-11.93	-9.53	-1.79	3.69	3.17	-0.36	-3.50	-3.98	-3.73	-2.02	4.00
18	-0.94	-4.33	-7.13	-13.27	-16.14	-12.74	-7.42	-3.74	-1.37	-0.79	-3.95
17	-0.57	-4.57	-2.23	1.27	2.73	2.40	-5.29	-11.99	-14.87	-14.13	-10.38
16	-5.71	-7.73	-1.73	-3.04	-7.23	-8.34	-6.54	0.39	6.23	3.74	-1.10
15	2.92	4.52	8.33	0.75	-2.72	-0.21	1.05	0.27	-3.11	-9.48	-2.28
14	14.69	20.43	19.03	13.70	17.78	22.97	15.69	11.12	10.03	13.73	17.49
13	4.62	5.44	2.42	2.74	9.09	8.69	6.36	16.27	24.37	20.76	16.37
12	-3.70	-6.00	-6.24	-5.36	-3.05	-5.54	-4.62	2.26	-1.23	-9.94	-4.39
11	-3.63	-4.73	-4.85	-2.16	-2.44	-5.43	-3.55	-1.57	-7.23	-8.38	-7.52
10	-5.31	-4.57	-3.89	-3.35	-5.01	-6.08	-3.99	-4.18	-7.10	-3.43	3.47
9	-7.36	-7.74	-7.60	-3.20	-8.94	-8.10	-6.96	-8.61	-9.33	-6.19	-6.38
8	-4.75	-5.69	-5.59	-5.46	-5.29	-4.37	-4.98	-7.45	-7.48	-6.08	-9.10
7	4.99	5.73	6.52	7.21	7.11	6.35	4.04	1.99	2.92	3.51	1.13
6	10.35	11.39	12.85	13.44	12.54	11.53	10.27	9.93	10.36	10.34	10.97
5	4.75	4.69	5.89	6.24	5.09	6.77	8.10	8.68	6.32	4.63	5.01
4	1.24	1.22	1.57	1.64	1.76	2.75	4.01	3.59	2.29	2.14	2.54
3	-3.26	-3.29	-2.89	-2.46	-2.19	-1.79	-2.00	-2.86	-2.34	-0.57	0.47
2	-3.01	-7.74	-7.26	-6.36	-6.09	-7.33	-3.62	-9.42	-8.33	-6.13	-5.44
1	-8.67	-8.67	-8.67	-8.67	-8.67	-8.67	-8.67	-8.67	-8.67	-8.67	-8.67

[illegible]	34.51	40.35	3.97	-5.60	-16.97	-22.14	-21.35	-13.63	14.12	10.69	0.29	60
[illegible]	-1.50	50.27	51.09	-3.86	-15.75	-20.47	-19.45	-11.66	9.20	10.49	-5.35	59
20.14	-16.44	20.37	35.71	12.85	-12.61	-17.99	-16.65	-9.45	7.75	7.67	-6.61	58
17.39	-16.72	-3.19	44.74	33.97	-3.12	-13.98	-13.63	-7.55	6.62	6.08	-6.25	57
[illegible]	-15.27	-9.64	14.35	40.14	13.58	-4.88	-7.54	-3.59	7.28	5.51	-5.63	56
[illegible]	-14.57	-10.01	-0.69	14.20	12.32	2.56	0.15	4.10	12.97	8.75	-3.42	55
16.12	-13.53	-9.67	-4.25	-0.09	-2.02	-3.83	-1.73	6.07	19.22	17.44	3.05	54
[illegible]	-11.71	-8.70	-4.31	-3.42	-7.43	-9.96	-8.35	-1.06	13.81	21.55	13.06	53
[illegible]	-9.34	-7.66	-5.08	-4.56	-7.99	-10.55	-9.92	-4.89	4.98	12.59	12.69	52
2.00	-2.34	-4.22	-4.18	-5.00	-7.76	-9.54	-8.74	-4.49	1.75	4.03	2.76	51
5.96	10.72	6.57	1.71	-2.30	-5.81	-7.49	-6.74	-3.30	0.68	0.23	-3.12	50
[illegible]	8.14	15.17	13.44	6.96	0.42	-3.66	-4.04	-2.65	-0.48	-2.10	-5.36	49
11.24	-4.24	6.10	15.44	17.51	11.52	3.96	-0.58	-1.24	-1.27	-3.85	-6.58	48
11.58	-7.49	-1.73	5.63	10.45	10.09	8.44	7.19	5.35	1.30	-3.72	-6.57	47
[illegible]	-6.83	-2.62	-0.21	-2.16	-3.62	-0.69	6.33	12.30	9.55	1.74	-3.15	46
[illegible]	-4.63	-1.78	-3.43	-7.81	-9.52	-7.75	-1.95	6.53	13.18	13.19	8.55	45
-1.23	-0.63	-1.69	-6.52	-9.93	-10.02	-7.95	-3.74	0.89	5.54	11.02	15.22	44
[illegible]	10.91	2.32	-5.55	-9.10	-9.52	-5.35	-1.09	0.28	-1.63	-2.08	1.62	43
[illegible]	16.91	10.13	2.84	-1.70	-2.65	0.09	1.34	-2.83	-6.92	-7.83	-6.29	42
-7.51	-9.03	1.82	5.66	10.07	13.41	11.13	1.92	-5.98	-9.00	-8.36	-6.41	41
-7.28	-9.30	-8.57	-4.51	4.02	14.94	15.94	6.80	-1.61	-6.05	-6.21	-4.58	40
[illegible]	-10.02	-9.62	-7.57	-3.65	0.42	2.22	4.75	7.15	7.23	6.10	4.60	39
-5.27	-8.29	-7.91	-6.73	-4.75	-4.39	-6.06	-3.94	1.76	12.10	21.60	15.96	38
8.26	3.80	0.17	-1.71	-3.17	-5.91	-6.90	-5.77	-3.45	2.07	4.58	4.10	37
[illegible]	16.51	16.95	12.56	4.04	-3.80	-6.36	-5.66	-3.65	-3.33	-7.05	-7.01	36
[illegible]	0.32	6.39	10.44	10.73	7.11	1.31	-1.27	-1.15	-4.77	-7.57	-6.72	35
-7.65	-7.48	-5.37	-5.05	-1.38	4.29	13.42	17.34	10.73	2.21	-2.69	-3.08	34
[illegible]	-7.71	-7.73	-7.78	-5.30	-3.22	5.03	12.06	12.05	9.80	9.77	7.61	33
[illegible]	-3.42	-5.38	-6.78	-6.32	-3.22	-2.57	-6.15	-5.11	-1.84	2.96	8.88	32
10.58	16.06	7.03	0.60	-1.95	-2.78	-5.86	-8.36	-8.27	-6.71	-3.12	0.28	31
6.79	10.05	10.49	11.41	13.21	8.10	-1.75	-6.10	-5.40	-3.95	-1.10	-1.08	30
[illegible]	-7.01	-4.49	-0.02	8.23	14.89	14.07	10.89	9.64	9.35	2.30	-5.04	29
-7.27	-7.57	-7.71	-6.48	-4.39	-2.54	0.26	5.34	14.73	17.04	6.56	0.40	28
-3.57	-6.35	-7.26	-6.84	-6.23	-6.77	-7.94	-6.65	-2.11	1.18	4.04	9.44	27
[illegible]	8.14	3.45	1.05	-3.10	-6.04	-6.75	-5.40	-3.75	-4.46	-4.34	-1.79	26
[illegible]	13.04	18.30	18.35	15.25	7.72	2.08	-1.42	-3.62	-6.21	-6.76	-5.94	25
-5.22	-3.44	1.23	3.40	7.70	12.11	15.92	14.73	5.90	-1.70	-5.94	-6.10	24
[illegible]	-5.53	-7.42	-7.32	-8.42	-4.40	0.21	9.52	14.51	16.53	15.69	12.77	23
[illegible]	-4.74	-7.99	-7.80	-9.07	-7.40	-5.74	-5.27	-3.49	0.52	9.77	17.08	22
8.07	3.85	-3.00	-6.65	-5.61	-5.89	-5.23	-7.29	-7.72	-8.64	-6.88	-6.06	21
[illegible]	16.58	15.52	10.42	11.36	5.40	4.15	-4.33	-7.26	-7.20	-6.54	-5.57	20
[illegible]	-2.02	4.00	12.44	17.57	26.96	17.35	14.16	6.33	3.96	-0.42	-2.34	19
1.57	-0.79	-3.95	-5.12	-5.14	0.22	1.60	6.29	10.12	18.71	19.09	11.50	18
4.57	-14.13	-10.38	-2.96	1.89	-3.82	-7.14	-9.73	-6.50	-1.42	9.05	10.46	17
[illegible]	3.74	-1.10	-7.74	-13.14	-15.16	-9.80	-6.48	-3.37	-3.68	-5.07	-6.83	16
[illegible]	-9.48	-2.28	2.35	7.81	7.44	2.08	-9.12	-13.11	-8.65	-3.02	-6.42	15
0.03	13.73	17.49	1.90	-4.41	-6.14	-5.47	2.36	16.61	10.96	-5.81	-13.69	14
[illegible]	20.76	15.37	14.54	20.74	27.69	17.14	11.40	5.36	-3.03	7.66	13.11	13
[illegible]	-8.94	-4.89	0.74	2.19	1.31	3.13	11.37	26.33	20.10	15.24	-0.72	12
7.23	-8.28	-0.52	-0.54	-10.22	-10.57	-6.92	-4.22	-3.64	-6.36	2.26	17.10	11
[illegible]	-3.48	3.47	-2.39	-7.23	-1.20	2.73	-5.35	-6.28	-6.02	-6.58	-8.73	10
[illegible]	-6.19	-6.38	-12.11	-10.63	-1.48	-3.77	-10.04	-2.75	-1.11	-6.38	-5.84	9
7.48	-6.08	-9.10	-12.02	-7.26	-1.54	-8.22	-11.50	-3.94	-7.25	-10.52	-0.39	8
2.92	3.91	1.13	1.75	8.24	6.06	-1.83	0.63	6.21	-6.22	-9.01	-0.75	7
[illegible]	10.84	10.97	14.93	16.93	9.13	5.40	14.25	16.23	2.82	5.92	15.11	6
[illegible]	4.63	5.61	8.66	8.27	4.88	6.03	10.99	7.14	2.76	13.05	18.62	5
2.29	2.14	2.59	2.52	2.48	4.45	7.35	4.30	-3.22	-2.53	7.26	2.51	4
[illegible]	-0.57	0.47	-1.59	-3.25	-1.49	0.64	-2.55	-6.53	-2.42	4.01	-5.15	3
[illegible]	-6.18	-5.44	-7.69	-9.45	-8.38	-7.33	-9.27	-10.13	-5.20	-1.82	-8.29	2
3.67	-8.67	-3.67	-8.67	-3.67	-8.67	-8.67	-8.67	-8.67	-8.67	-8.67	-8.67	1
[illegible]	70	71	72	73	74	75	76	77	78	79	80	

119	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
118	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
117	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
116	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
115	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
114	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
113	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
112	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
111	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
110	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
109	0.04	0.02	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	
108	0.09	0.05	0.03	0.02	0.01	0.00	0.00	0.00	0.00	0.00	
107	0.21	0.12	0.07	0.04	0.02	0.01	0.01	0.00	0.00	0.00	
106	0.51	0.29	0.17	0.09	0.05	0.03	0.02	0.01	0.00	0.00	
105	1.20	0.71	0.41	0.23	0.13	0.07	0.04	0.02	0.01	0.01	
104	2.66	1.64	0.95	0.54	0.30	0.17	0.09	0.05	0.03	0.01	
103	5.08	3.47	2.17	1.28	0.72	0.40	0.21	0.11	0.06	0.03	
102	7.50	6.13	4.39	2.82	1.67	0.94	0.51	0.27	0.14	0.07	
101	7.64	7.95	7.05	5.34	3.55	2.13	1.19	0.64	0.33	0.17	
100	5.12	6.91	7.96	7.61	6.22	4.31	2.62	1.46	0.73	0.40	
99	2.23	3.92	5.90	7.51	7.94	6.53	5.02	3.13	1.75	0.92	
98	0.44	1.40	2.87	4.30	6.75	7.54	7.33	5.64	3.62	2.05	
97	-0.42	0.02	0.79	2.02	3.90	5.89	7.45	7.56	6.11	4.05	
96	-0.78	-0.61	-0.26	0.37	1.41	3.00	5.05	6.93	7.52	6.41	
95	-0.75	-0.84	-0.72	-0.42	0.11	1.00	2.40	4.34	6.32	7.27	
94	0.29	-0.61	-0.84	-0.78	-0.53	-0.06	0.72	1.97	3.74	5.69	
93	5.57	1.23	-0.35	-0.81	-0.82	-0.61	-0.18	0.55	1.67	3.27	
92	20.56	9.65	2.73	0.04	-0.75	-0.85	-0.66	-0.23	0.46	1.50	
91	29.21	26.90	14.82	4.37	0.60	-0.65	-0.83	-0.63	-0.17	0.49	
90	12.62	26.60	31.11	20.45	7.64	1.32	-0.46	-0.72	-0.52	-0.06	
89	-1.35	5.78	20.41	30.73	25.62	13.35	2.10	-0.24	-0.59	-0.36	
88	-4.44	-3.23	1.44	14.55	31.10	29.33	12.79	2.78	-0.03	-0.43	-
87	-4.81	-4.78	-4.17	-1.18	9.75	28.67	31.19	14.40	3.23	0.17	-
86	-2.37	-4.52	-4.66	-4.60	-2.53	6.76	26.25	31.34	15.00	3.68	
85	25.82	3.11	-3.62	-4.76	-4.62	-3.01	5.41	24.27	30.01	15.01	
84	104.22	64.14	16.09	-1.70	-4.52	-4.51	-2.32	5.05	22.41	27.39	1
83	46.36	113.25	112.59	39.41	0.97	-4.20	-4.10	-2.04	5.80	20.14	2
82	-17.92	2.30	30.23	152.67	61.68	2.83	-3.81	-3.22	-0.75	6.51	1
81	-23.32	-26.87	-24.40	52.71	170.73	68.36	2.45	-3.23	-2.12	0.99	
80	-23.70	-27.17	-32.06	-35.78	42.59	165.85	52.18	5.59	-2.30	-0.50	
79	-22.25	-25.16	-29.22	-33.73	-33.63	62.36	136.21	27.79	-0.64	-1.08	
78	-18.27	-21.69	-24.95	-28.67	-30.75	-16.60	94.12	83.24	10.34	-0.65	
77	-7.23	-16.45	-20.74	-24.57	-25.73	-23.11	16.93	71.77	44.72	3.93	
76	74.12	-5.13	-17.13	-21.25	-22.17	-19.59	-8.63	53.14	74.67	19.11	
75	214.93	67.64	-13.76	-18.59	-19.39	-17.04	-11.55	15.00	64.03	41.50	1
74	46.67	194.65	21.40	-15.97	-17.19	-14.94	-10.54	1.96	34.67	46.27	2
73	-50.90	140.70	56.80	-9.04	-15.73	-13.57	-9.50	-1.08	17.47	32.48	2
72	-49.94	37.01	145.85	12.73	-14.27	-12.67	-8.94	-2.97	10.93	21.15	1
71	-40.[illegible]	-12.21	130.95	54.02	-10.34	-11.73	-8.44	-2.60	4.02	15.18	1
70	-34.65	-26.03	75.16	96.64	1.40	-10.07	-7.60	-2.09	0.34	14.00	1
69	-30.19	-23.45	23.64	134.23	25.85	-5.54	-5.31	-2.07	5.47	12.90	1
68	-26.66	-22.91	-0.41	71.30	49.04	3.70	-1.73	0.32	6.07	12.74	1
67	-24.53	-19.77	-6.30	35.15	40.84	12.81	3.76	4.92	9.54	15.07	1
66	-22.13	-17.96	-7.23	21.91	31.61	10.92	3.82	6.78	12.68	20.72	1
65	-20.25	-16.13	-6.65	15.61	22.37	5.41	-1.27	1.92	8.06	20.95	2
64	-17.90	-14.10	-5.87	13.12	19.85	2.30	-4.27	-3.57	0.06	10.06	2
63	-15.00	-11.70	-4.45	12.19	17.50	2.46	-4.51	-5.24	-3.40	1.27	1
62	-5.60	-7.52	-1.74	12.16	13.74	4.05	-3.92	-5.12	-3.05	-1.20	
61	-2.60	-0.65	4.34	15.00	13.20	5.16	-3.22	-4.75	-2.35	-1.63	

[illegible]	90	91	92	93	94	95	96	97	98	99	100	
.[illegible]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	119
.[illegible]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	118
.[illegible]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	117
.[illegible]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	116
.0[illegible]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	115
.[illegible]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	114
.0[illegible]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	113
.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	112
.0[illegible]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	111
.0[illegible]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	110
.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	109
.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	108
.0[illegible]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	107
.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	106
.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	105
.0	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	104
.0[illegible]	0.03	0.02	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	103
.14	0.07	0.04	0.02	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	102
.37	0.17	0.09	0.04	0.02	0.01	0.00	0.00	0.00	0.00	0.00	0.00	101
.7[illegible]	0.40	0.20	0.10	0.05	0.02	0.01	0.00	0.00	0.00	0.00	0.00	100
.76	0.92	0.47	0.23	0.11	0.05	0.02	0.01	0.00	0.00	0.00	0.00	99
.62	2.05	1.07	0.53	0.25	0.11	0.05	0.02	0.01	0.00	0.00	0.00	98
.1	4.05	2.31	1.19	0.59	0.26	0.11	0.05	0.02	0.01	0.00	0.00	97
.5	6.41	4.39	2.53	1.29	0.60	0.26	0.11	0.04	0.02	0.01	0.00	96
.32	7.27	6.53	4.63	2.70	1.35	0.61	0.25	0.10	0.04	0.01	0.00	95
7	5.69	6.59	6.49	4.75	2.78	1.36	0.59	0.23	0.09	0.03	0.01	94
.6	3.27	5.10	6.43	6.32	4.76	2.77	1.32	0.54	0.20	0.07	0.02	93
.46	1.50	2.92	4.60	5.93	6.07	4.66	2.68	1.22	0.47	0.16	0.05	92
.17	0.49	1.44	2.69	4.18	5.52	5.82	4.51	2.53	1.09	0.39	0.12	91
.3	-0.06	0.61	1.47	2.54	3.94	5.19	5.61	4.32	2.30	0.92	0.29	90
.59	-0.36	0.12	0.77	1.54	2.43	3.57	4.94	5.44	4.07	2.03	0.73	89
.03	-0.43	-0.18	0.33	0.94	1.58	2.28	3.35	4.80	5.27	3.77	1.70	88
.2	0.17	-0.27	0.02	0.53	1.06	1.54	2.11	3.20	4.73	5.18	3.43	87
.[illegible]	3.68	0.38	-0.08	0.23	0.73	1.15	1.48	1.99	3.21	5.04	5.37	86
.01	15.01	3.95	0.65	0.19	0.52	0.96	1.25	1.54	2.31	4.23	6.24	85
.4	27.39	14.17	4.17	1.04	0.58	0.88	1.26	1.64	2.51	4.32	6.27	84
.8	20.14	23.73	12.80	4.45	1.57	1.09	1.43	2.06	3.03	4.00	3.79	83
.75	6.51	17.66	19.52	11.40	4.90	2.31	1.33	2.46	3.19	2.88	1.46	82
.17	0.99	7.25	14.74	15.40	10.35	5.68	3.43	3.04	3.17	2.32	1.12	81
.3	-0.50	2.68	7.36	11.47	12.09	9.81	6.90	4.88	3.86	2.78	1.57	80
.64	-1.38	1.10	3.87	6.36	8.19	9.45	9.80	8.49	5.85	2.91	0.15	79
.84	-0.65	0.37	2.50	3.93	4.51	5.42	7.70	10.34	10.08	6.00	2.20	78
.[illegible]	3.33	0.39	1.87	3.13	3.11	2.72	3.62	6.89	11.26	10.55	4.83	77
.6[illegible]	19.11	2.66	2.07	3.07	3.00	1.96	1.45	2.70	6.91	12.61	9.69	76
33	41.50	10.49	4.36	4.10	3.70	2.30	0.91	0.71	2.45	7.93	14.18	75
.6[illegible]	46.27	22.17	10.16	7.47	5.91	3.67	1.42	0.17	0.39	2.54	9.60	74
4[illegible]	32.48	24.54	15.21	12.80	10.95	7.18	3.19	0.62	-0.23	0.37	3.01	73
93	21.15	17.36	12.12	13.16	15.78	13.91	7.70	2.49	0.10	-0.30	0.32	72
[illegible]	16.18	12.04	6.06	6.49	12.06	17.62	15.36	7.46	1.85	-0.21	-0.46	71
.3	14.00	10.36	3.23	1.10	3.51	10.76	18.15	15.66	6.65	1.29	-0.23	70
47	12.90	10.36	2.89	-0.73	-0.63	2.59	9.88	17.61	14.55	5.72	1.08	69
.37	12.74	11.09	3.67	-0.80	-1.76	-0.74	2.24	9.27	16.38	12.96	4.87	68
5[illegible]	15.07	13.09	5.13	-0.10	-1.64	-1.50	-0.39	2.30	8.73	14.84	11.22	67
[illegible]	20.73	13.57	8.46	1.29	-1.09	-1.41	-0.92	0.01	2.31	8.11	13.30	66
96	20.95	27.82	16.79	4.82	0.14	-0.85	-0.77	-0.40	0.15	2.14	7.55	65
00	10.06	25.61	27.18	13.36	3.76	0.59	-0.05	-0.09	-0.16	0.03	1.90	64
4[illegible]	1.37	11.94	23.81	22.25	11.80	4.63	1.73	0.80	0.30	-0.16	-0.15	63
35	-1.20	3.39	10.87	17.62	17.63	12.01	6.26	2.90	1.30	0.37	-0.23	62
8[illegible]	-1.63	1.28	3.39	6.85	11.34	14.54	12.94	7.84	3.57	1.30	0.25	61

60	[illegible]	[illegible]	[illegible]	23.29	[illegible]	9.12	-1.71	-4.25	[illegible]	-1.
59	[illegible]	-4.35	[illegible]	[illegible]	[illegible]	13.75	[illegible]	[illegible]	[illegible]	-1.
58	-10.37	[illegible]	[illegible]	5.74	[illegible]	24.29	12.77	[illegible]	[illegible]	-1.
57	-10.13	-9.36	-4.55	[illegible]	[illegible]	15.92	[illegible]	11.95	[illegible]	[illegible]
56	-9.54	-5.23	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	11.94	12.
55	-8.14	-3.05	-3.63	-1.17	[illegible]	2.48	0.12	[illegible]	[illegible]	13.
54	-4.43	-5.52	-4.14	[illegible]	3.30	2.32	-0.97	-2.72	[illegible]	3.7
53	4.12	[illegible]	[illegible]	1.45	3.59	2.28	-1.03	-3.13	-3.37	-2.
52	10.32	[illegible]	6.73	5.94	4.37	1.89	-1.65	-3.51	[illegible]	-3.
51	3.35	6.71	11.22	13.63	10.27	3.45	-1.69	[illegible]	-4.19	-3.4
50	-4.49	-2.43	3.52	[illegible]	17.14	9.75	0.36	-3.13	[illegible]	-3.
49	-6.99	-6.45	-3.46	3.38	13.42	16.59	8.44	0.48	-2.41	-2.
48	-7.42	-6.61	-4.41	-1.12	4.07	12.19	15.83	9.72	3.08	-0.
47	-6.82	-5.33	-2.85	-0.74	[illegible]	3.23	10.47	15.98	12.29	5.9
46	-4.27	-2.95	-0.50	[illegible]	-0.43	-1.01	1.09	7.00	13.48	12.7
45	3.72	1.57	1.35	-0.16	-2.35	-3.45	-3.22	[illegible]	[illegible]	8.
44	14.71	[illegible]	[illegible]	[illegible]	-4.41	-5.27	-4.06	-3.19	-1.40	0.6
43	8.50	12.41	9.27	2.59	-3.22	-5.15	-4.33	-2.84	[illegible]	-1.
42	-2.36	2.09	6.41	8.59	5.51	1.22	-0.04	[illegible]	-3.71	-1.
41	-4.31	-2.44	1.45	7.20	13.55	14.05	12.35	[illegible]	3.59	3.
40	-3.54	-2.05	0.11	1.62	4.43	8.56	11.07	10.44	7.65	3.
39	2.03	-1.23	-3.13	-3.14	-3.66	-4.26	-2.53	[illegible]	3.17	4.
38	6.53	-3.39	-4.15	-4.87	[illegible]	-5.92	-5.37	[illegible]	[illegible]	2.
37	4.72	4.97	2.63	-0.38	-0.65	-0.58	-1.10	0.21	1.72	2.
36	-3.19	1.75	9.74	18.19	15.28	11.13	7.14	3.87	1.42	-0.
35	-5.69	-1.79	5.53	9.94	9.28	6.63	5.15	2.63	-0.31	-3.
34	-2.60	[illegible]	-1.43	-5.73	-5.30	-3.22	-0.72	2.58	[illegible]	1.
33	4.95	[illegible]	-5.47	-6.92	-6.89	-5.57	-0.99	5.06	10.61	15.
32	12.75	7.74	[illegible]	-4.53	-4.44	-0.71	2.27	3.72	3.33	[illegible]
31	4.47	7.35	9.54	11.00	11.29	10.47	1.59	[illegible]	-6.66	-7.
30	-3.93	[illegible]	-1.04	2.56	15.74	[illegible]	[illegible]	[illegible]	-5.46	-5.
29	-6.70	-7.34	-5.55	[illegible]	-1.43	0.04	1.53	[illegible]	9.54	9.
28	-5.48	[illegible]	-2.53	-1.22	-4.43	-5.64	-5.07	-3.18	13.23	19.
27	13.01	14.64	14.03	[illegible]	-3.70	-5.53	-5.43	-2.01	[illegible]	1.
26	8.75	20.13	15.56	9.93	4.95	0.52	-0.23	0.34	[illegible]	-6.
25	-5.12	-5.31	-4.01	-2.64	1.74	10.60	13.38	7.55	-2.91	-6.
24	-5.70	-6.93	-7.57	-0.44	-3.70	3.09	10.34	[illegible]	6.35	0.
23	5.76	-2.18	-4.84	-5.20	-1.85	0.42	-3.76	-1.38	2.10	11.
22	14.99	10.23	7.52	4.93	2.51	-2.44	-5.96	-0.79	-3.71	2.
21	-4.30	[illegible]	6.62	16.27	11.84	-1.22	-5.53	-5.37	-3.11	-0.
20	-7.50	-6.51	-2.53	2.93	6.67	8.10	4.23	[illegible]	3.71	-6.
19	-6.56	[illegible]	-4.13	-3.72	-4.92	-1.65	6.26	20.61	13.11	6.
18	3.73	-1.19	-2.05	[illegible]	-5.94	-6.36	-1.46	7.49	3.36	11.
17	[illegible]	17.38	[illegible]	0.18	-4.75	[illegible]	-1.50	[illegible]	-5.26	-5.
16	-2.78	2.17	13.05	12.44	3.46	-1.11	-2.19	-4.75	[illegible]	-6.
15	-8.66	-6.26	-0.95	3.67	8.01	10.09	6.95	-2.79	-7.78	-7.
14	-8.23	-3.29	-2.37	-4.31	-4.77	4.15	13.29	12.77	2.99	2.
13	1.94	-7.93	-2.22	-2.58	-6.88	-5.45	4.37	11.55	11.42	14.
12	-4.27	19.83	9.79	-9.43	-6.47	-5.33	-2.97	-2.46	-5.43	-3.
11	22.22	13.93	6.67	15.46	-5.39	-7.50	-1.60	-6.47	-8.41	-8.
10	-12.06	0.41	26.10	4.70	10.62	10.04	-1.86	-2.20	-3.41	-6.
9	-6.86	-3.03	[illegible]	1.36	7.76	19.25	25.01	7.23	3.96	2.
8	-4.99	-2.75	-9.71	-1.47	[illegible]	2.42	0.10	9.29	[illegible]	9.
7	-11.79	-3.33	-3.74	-7.49	-4.72	-8.13	-1.11	-6.12	-4.76	3.
6	-2.96	5.68	-1.69	-8.93	[illegible]	-4.53	-5.63	-5.97	-5.10	-8.
5	8.30	22.76	9.03	13.86	-1.29	0.08	[illegible]	-1.91	-9.36	-3.
4	-0.11	17.89	-3.93	16.95	[illegible]	10.26	4.53	5.59	9.39	-9.
3	-5.17	13.19	-0.03	0.25	-2.86	-3.19	8.73	13.13	[illegible]	16.
2	-8.72	1.07	-6.34	-5.62	[illegible]	-5.71	-3.44	-5.99	3.75	-4.
1	-8.67	-8.67	-8.67	-8.67	-8.67	-8.67	-8.67	-8.67	-8.67	-8.
	81	82	83	84	85	86	87	88	89	

[illegible]	-1.67	0.80	2.03	1.75	2.67	6.95	12.79	13.35	8.69	3.43	0.96	60
[illegible]	-1.45	0.90	1.84	0.62	-0.77	0.13	4.72	12.05	14.19	5.35	2.70	59
.75	-0.42	1.23	3.11	0.91	-1.18	-1.99	-0.73	4.18	11.96	13.65	7.03	58
[illegible]	3.95	3.14	2.88	1.38	-0.67	1.98	-1.90	-0.31	4.73	12.04	12.13	57
[illegible]	12.21	9.52	5.94	2.64	0	-1.46	-1.71	-1.04	0.83	5.75	11.89	56
[illegible]	13.07	17.70	13.03	6.49	1.	-0.35	-1.33	-0.75	0.23	1.99	6.89	55
.02	3.74	14.07	20.83	14.84	5.4.	0.45	-1.07	-0.72	0.42	1.06	2.82	54
[illegible]	-2.01	3.62	14.21	19.88	13.04	4.26	0.08	-0.85	0.19	1.11	1.08	53
[illegible]	-3.30	-1.18	4.07	12.56	16.32	10.59	3.43	0.04	-0.25	0.90	0.67	52
.18	-3.45	-2.07	0.08	3.89	9.79	12.85	8.62	2.75	0.25	0.46	0.49	51
[illegible]	-3.23	-2.02	-0.63	0.70	3.10	7.73	10.93	7.24	2.22	0.70	0.21	50
[illegible]	-2.39	-1.53	-0.67	0.01	0.60	2.53	7.67	10.65	6.24	2.11	0.28	49
.63	-0.13	-0.58	-0.44	-0.15	-0.01	0.26	2.90	9.27	10.82	5.78	1.12	48
.29	5.98	2.24	0.51	-0.11	-0.33	-0.49	0.14	4.50	11.04	10.73	3.83	47
[illegible]	12.71	8.31	3.73	0.75	-0.56	-1.02	-1.09	0.72	5.76	11.02	8.14	46
[illegible]	8.17	10.36	9.24	4.30	0.09	-1.36	-1.72	-1.16	0.98	4.93	8.13	45
.40	0.63	3.59	8.41	9.60	4.28	-0.25	-1.55	-1.35	-0.60	0.22	2.45	44
[illegible]	-1.47	-0.34	2.29	7.29	9.89	6.03	1.39	-0.75	-0.82	-0.55	-0.33	43
[illegible]	-1.03	-0.55	-0.03	1.74	7.00	10.93	8.55	3.57	0.79	-0.66	-1.10	42
.59	0.63	-0.19	-0.60	-0.71	0.59	4.76	8.83	9.31	6.45	2.02	-0.58	41
.65	3.49	0.68	-0.56	-1.49	-1.85	-0.43	1.55	4.78	8.20	8.31	4.47	40
[illegible]	4.27	2.88	0.70	-1.01	-2.08	-1.18	-1.64	-1.24	0.79	5.48	9.50	39
.59	2.53	5.80	5.95	3.67	1.24	0.51	-2.28	-2.68	-1.97	-0.51	3.84	38
.72	2.29	4.54	8.52	10.47	9.52	7.93	1.93	-0.96	-1.07	-1.82	-0.81	37
[illegible]	-0.22	-0.58	1.20	3.33	5.79	9.04	9.30	5.74	3.14	0.09	-1.55	36
[illegible]	-3.74	-4.50	-4.30	-4.04	-3.11	-0.92	3.22	6.65	9.08	6.92	-0.04	35
[illegible]	1.99	-1.33	-2.22	-4.00	-4.77	-3.02	-2.06	-0.15	3.47	8.26	6.54	34
[illegible]	15.09	14.54	13.74	8.93	1.47	0.23	-0.44	-2.14	-2.06	1.12	7.06	33
[illegible]	-0.54	2.70	7.62	11.74	11.28	7.78	5.69	-1.05	-3.33	-2.34	2.07	32
.66	-7.90	-7.38	-4.46	-2.61	-1.35	2.78	9.43	4.54	-1.43	-2.69	0.61	31
[illegible]	-5.85	-4.20	-3.67	-2.51	-4.77	-3.66	1.85	8.59	3.85	0.07	1.02	30
[illegible]	9.58	11.23	4.16	0.10	-1.99	-2.67	-1.49	3.52	5.14	1.51	2.21	29
.20	19.79	13.54	10.27	4.74	0.09	-1.05	-1.37	0.08	2.42	-1.37	0.0	28
.47	1.01	-0.65	-1.49	5.73	7.57	1.08	-2.07	0.45	4.96	0.0	0.0	27
[illegible]	-6.50	-7.21	-5.50	-3.96	9.65	2.44	-3.75	0.0	0.0	0.0	0.0	26
[illegible]	-6.46	-7.89	-6.38	-5.07	7.09	0.0	0.0	0.0	0.0	0.0	0.0	25
.35	0.14	-4.04	-2.81	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
[illegible]	11.35	13.44	16.10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	23
[illegible]	2.94	15.34	15.47	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	22
[illegible]	-0.70	-0.66	-6.72	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	21
.71	-6.17	-8.73	-9.08	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	20
[illegible]	6.35	-3.12	-4.29	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	19
.80	11.59	14.08	14.17	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	18
.26	-5.06	-0.30	11.89	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	17
[illegible]	-6.57	-4.37	-1.28	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	16
[illegible]	-7.29	-2.99	-1.54	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15
.99	2.01	6.86	-2.25	-8.93	0.0	0.0	0.0	0.0	0.0	0.0	0.0	14
[illegible]	14.76	29.45	12.19	-3.63	0.0	0.0	0.0	0.0	0.0	0.0	0.0	13'
[illegible]	-3.21	4.61	6.57	7.64	4.19	0.0	0.0	0.0	0.0	0.0	0.0	12
.41	-8.45	-6.68	-4.65	-7.59	1.77	0.0	0.0	0.0	0.0	0.0	0.0	11
[illegible]	-6.63	-5.37	-5.42	-6.43	-1.77	7.55	0.0	0.0	0.0	0.0	0.0	10
[illegible]	2.15	2.03	1.40	-0.70	-2.53	4.36	0.0	0.0	0.0	0.0	0.0	9
.20	9.49	19.20	12.92	4.20	5.28	2.64	0.0	0.0	0.0	0.0	0.0	8
.76	3.55	6.36	3.95	-1.78	-5.67	3.17	10.21	0.0	0.0	0.0	0.0	7
[illegible]	-9.07	-3.48	-3.89	-9.17	-7.75	-9.69	0.22	0.0	0.0	0.0	0.0	6
[illegible]	-3.67	-7.76	-1.25	-4.80	-8.41	-1.49	-5.03	-9.10	0.0	0.0	0.0	5
.39	-0.62	9.03	5.13	9.50	14.13	13.20	10.10	-2.50	0.0	0.0	0.0	4
[illegible]	10.23	4.27	8.94	5.12	6.29	7.03	4.92	7.36	12.48	0.0	0.0	3
[illegible]	-4.97	-2.30	-7.27	-7.01	-7.36	-7.29	-6.65	-7.05	-5.30	0.0	0.0	2
.67	-8.67	-8.67	-8.67	-8.67	-8.67	-8.67	-8.67	-8.67	-8.67	-8.67	0.0	/1
	90	91	92	93	94	95	96	97	98	99	100	

	101	102	103	104	105	106	107	108	109	110
119	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
118	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
117	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
116	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
115	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
114	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
113	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
112	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
111	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
110	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
109	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
108	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
107	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
106	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
105	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
104	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
103	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
102	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
101	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
99	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
98	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
97	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
96	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
95	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
94	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
93	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
92	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
91	0.03	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
90	0.09	0.02	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
89	0.22	0.05	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00
88	0.56	0.16	0.04	0.01	0.00	0.00	0.00	0.00	0.00	0.00
87	1.36	0.39	0.09	0.0	0.0	0.0	0.0	0.0	0.0	0.0
86	2.85	0.85	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
85	4.77	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
84	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
83	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
82	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
81	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
80	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
79	-1.07	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
78	0.43	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
77	1.49	0.27	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
76	2.85	0.43	0.04	0.0	0.0	0.0	0.0	0.0	0.0	0.0
75	8.60	2.62	1.00	0.40	0.0	0.0	0.0	0.0	0.0	0.0
74	15.23	7.09	2.62	0.51	-0.46	0.0	0.0	0.0	0.0	0.0
73	12.03	11.72	6.97	2.15	0.91	0.0	0.0	0.0	0.0	0.0
72	4.35	13.37	12.56	4.91	1.64	0.63	0.0	0.0	0.0	0.0
71	0.53	5.62	13.35	9.66	2.60	0.03	-0.46	0.0	0.0	0.0
70	-0.23	1.35	6.21	12.81	8.21	1.26	0.11	0.05	0.0	0.0
69	-0.01	0.21	1.98	7.68	13.39	6.85	1.57	0.42	0.20	0.0
68	1.11	0.27	0.54	2.48	8.95	12.89	5.84	1.70	0.79	0.69
67	4.29	1.18	0.48	0.66	3.08	9.98	11.51	5.73	2.19	1.46
66	9.77	3.00	1.15	0.63	0.74	3.93	10.19	10.37	5.22	2.63
65	12.02	8.53	3.14	1.13	0.51	1.09	4.62	10.93	9.12	5.37
64	7.14	11.15	7.39	2.31	1.04	0.49	1.50	5.68	10.03	7.27
63	1.77	7.20	10.47	5.75	1.95	0.90	0.49	2.20	7.27	9.50
62	-0.18	2.00	7.89	9.63	4.08	1.47	0.52	0.68	3.65	9.27
61	-0.20	-0.06	2.83	2.91	7.83	2.82	0.99	0.29	1.31	6.57
60	0.18	-0.10	0.30	4.46	0.47	5.73	1.95	0.49	0.73	3.54

109	110	111	112	113	114	115	
0.00	0.00	0.00	0.00	0.00	0.00	0.00	119
0.00	0.00	0.00	0.00	0.00	0.00	0.00	118
0.00	0.00	0.00	0.00	0.00	0.00	0.00	117
0.00	0.00	0.00	0.00	0.00	0.00	0.00	116
0.00	0.00	0.00	0.00	0.00	0.00	0.00	115
0.00	0.00	0.00	0.00	0.00	0.00	0.00	114
0.00	0.00	0.00	0.00	0.00	0.00	0.00	113
0.00	0.00	0.00	0.00	0.00	0.00	0.00	112
0.00	0.00	0.00	0.00	0.00	0.00	0.00	111
0.00	0.00	0.00	0.00	0.00	0.00	0.00	110
0.00	0.00	0.00	0.00	0.00	0.00	0.00	109
0.00	0.00	0.00	0.00	0.00	0.00	0.00	108
0.00	0.00	0.00	0.00	0.00	0.00	0.00	107
0.00	0.00	0.00	0.00	0.00	0.00	0.00	106
0.00	0.00	0.00	0.00	0.00	0.00	0.00	105
0.00	0.00	0.00	0.00	0.00	0.00	0.00	104
0.00	0.00	0.00	0.00	0.00	0.00	0.00	103
0.00	0.00	0.00	0.00	0.00	0.00	0.00	102
0.00	0.00	0.00	0.00	0.00	0.00	0.00	101
0.00	0.00	0.00	0.00	0.00	0.00	0.00	100
0.00	0.00	0.00	0.00	0.00	0.00	0.00	99
0.00	0.00	0.00	0.00	0.00	0.00	0.00	98
0.00	0.00	0.00	0.00	0.00	0.00	0.00	97
0.00	0.00	0.00	0.00	0.00	0.00	0.00	96
0.00	0.00	0.00	0.00	0.00	0.00	0.00	95
.00	0.00	0.00	0.00	0.00	0.00	0.00	94
.00	0.00	0.00	0.00	0.00	0.00	0.00	93
.00	0.00	0.00	0.00	0.00	0.00	0.00	92
.00	0.00	0.00	0.00	0.00	0.00	0.00	91
.00	0.00	0.00	0.00	0.00	0.00	0.00	90
.0	0.00	0.00	0.00	0.00	0.00	0.00	89
.0	0.00	0.00	0.00	0.00	0.00	0.00	87
.0	0.0	0.0	0.0	0.00	0.00	0.00	86
.0	0.0	0.0	0.0	0.0	0.0	0.0	85
.0	0.0	0.0	0.0	0.0	0.0	0.0	84
.0	0.0	0.0	0.0	0.0	0.0	0.0	83
.0	0.0	0.0	0.0	0.0	0.0	0.0	82
.0	0.0	0.0	0.0	0.0	0.0	0.0	81
.0	0.0	0.0	0.0	0.0	0.0	0.0	80
.0	0.0	0.0	0.0	0.0	0.0	0.0	79
.0	0.0	0.0	0.0	0.0	0.0	0.0	78
.0	0.0	0.0	0.0	0.0	0.0	0.0	77
.0	0.0	0.0	0.0	0.0	0.0	0.0	76
.0	0.0	0.0	0.0	0.0	0.0	0.0	75
.0	0.0	0.0	0.0	0.0	0.0	0.0	74
.0	0.0	0.0	0.0	0.0	0.0	0.0	73
.0	0.0	0.0	0.0	0.0	0.0	0.0	72
.0	0.0	0.0	0.0	0.0	0.0	0.0	71
.0	0.0	0.0	0.0	0.0	0.0	0.0	70
.0	0.0	0.0	0.0	0.0	0.0	0.0	69
.2	0.0	0.0	0.0	0.0	0.0	0.0	68
.7	0.69	0.0	0.0	0.0	0.0	0.0	67
.19	1.46	1.47	0.0	0.0	0.0	0.0	66
2.	2.63	1.56	0.55	0.0	0.0	0.0	65
1.	5.07	3.56	2.30	0.0	0.0	0.0	64
02	7.27	3.70	1.65	-0.25	0.0	0.0	63
27	9.59	5.29	2.62	1.18	0.0	0.0	62
6	9.27	7.71	3.64	1.72	0.36	0.0	61
31	6.57	10.17	6.43	3.43	1.70	0.0	60
33	2.54	10.75	5.51	4.48	1.47	-0.35	60

59	0.64	0.30	0.02	1.10	6.92	8.63	4.00	1.22	0.39	1.79	7.75	11.1
58	1.32	0.54	0.47	0.17	2.97	0.56	6.95	2.76	1.03	1.40	5.37	9.8
57	5.15	1.14	0.75	0.45	0.76	5.59	8.84	5.34	2.29	1.86	3.87	7.1
56	9.80	2.24	0.96	0.31	0.16	2.50	3.06	8.15	4.33	2.68	2.93	4.0
55	11.33	6.93	1.94	0.91	0.19	0.57	5.42	9.68	6.98	2.52	2.14	2.0
54	8.35	9.91	4.26	1.20	0.31	-0.36	2.75	9.20	9.53	4.35	1.38	1.2
53	4.03	9.60	7.63	2.59	0.55	-0.57	0.78	6.99	11.21	5.39	0.34	0.5
52	1.06	6.78	10.02	5.35	1.21	-0.42	-0.31	4.22	11.22	6.91	0.31	0.0
51	-0.27	2.45	9.21	9.10	2.83	-0.14	-0.73	1.92	9.23	8.86	1.70	-0.0
50	-0.76	-0.12	5.49	11.49	6.11	0.53	-0.85	0.57	6.00	9.68	3.32	0.4
49	-1.07	-1.21	1.75	9.91	10.47	2.77	-0.58	-0.01	2.93	7.24	6.05	1.8
48	-1.20	-1.50	-0.02	5.51	11.01	7.53	1.23	0.12	1.22	3.49	5.30	3.8
47	-0.61	-1.53	-0.55	2.00	5.50	0.75	5.73	1.91	1.04	1.52	3.33	4.3
46	-1.69	-0.93	-0.74	0.17	1.07	4.55	7.59	5.39	2.60	1.40	1.92	3.2
45	6.50	2.38	0.42	-0.60	-1.30	-0.13	3.92	6.53	4.04	2.93	2.65	3.6
44	6.90	3.83	5.36	1.03	-0.53	-0.86	1.83	4.60	4.66	3.67	3.72	5.5
43	1.85	7.19	10.85	6.41	2.50	0.76	1.31	2.49	2.14	2.31	2.21	0.0
42	-0.44	1.80	5.10	7.43	5.36	2.40	1.13	2.85	2.06	1.57	0.0	0.0
41	-0.33	-1.46	-0.14	2.32	5.24	3.35	0.69	2.60	4.31	0.0	0.0	0.0
40	1.33	-0.35	-0.04	-0.43	2.84	2.32	-0.93	0.0	0.0	0.0	0.0	0.0
39	3.34	3.20	1.10	0.46	2.33	6.51	0.0	0.0	0.0	0.0	0.0	0.0
38	6.15	3.53	2.90	1.31	2.70	0.0	0.0	0.0	0.0	0.0	0.0	0.0
37	-1.27	5.42	4.08	-0.34	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
36	-2.31	1.40	9.34	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
35	-2.56	-1.00	4.58	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
34	-0.05	-0.91	3.73	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
33	3.95	0.15	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
32	3.25	1.42	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
31	2.72	0.97	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
30	2.71	0.72	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
29	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
28	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
27	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
26	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
25	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
24	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
23	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
22	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
21	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
20	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
19	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
18	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
17	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
16	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
15	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
14	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
12	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
11	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	101	102	103	104	105	106	107	108	109	110	111	

[illegible]	1.79	7.75	11.12	0.00	2.00	0.41	59
[illegible]	1.40	5.07	5.89	7.13	2.91	1.25	58
.29	1.86	3.67	7.16	6.21	3.48	1.53	57
[illegible]	2.68	2.33	4.60	5.54	3.26	2.10	56
[illegible]	3.32	2.14	2.69	4.06	2.98	3.12	55
.53	4.35	1.38	1.35	2.85	2.70	3.86	54
[illegible]	5.39	0.94	0.53	2.09	3.25	3.65	53
[illegible]	6.91	0.61	0.09	1.69	2.96	3.02	52
[illegible]	8.86	1.70	-0.01	1.39	3.03	3.25	51
.00	9.68	3.32	0.41	0.97	3.16	4.79	50
[illegible]	7.24	6.05	1.82	0.82	2.70	6.07	49
[illegible]	3.49	5.30	3.85	1.82	2.46	5.67	48
.34	1.52	3.33	4.36	3.17	2.93	5.23	47
[illegible]	1.47	1.92	3.21	2.77	2.01	0.0	46
[illegible]	2.98	2.65	3.66	2.78	0.0	0.0	45
.66	3.67	3.73	5.50	0.0	0.0	0.0	44
.1[illegible]	2.31	2.21	0.0	0.0	0.0	0.0	43
[illegible]	1.57	0.0	0.0	0.0	0.0	0.0	42
[illegible]	0.0	0.0	0.0	0.0	0.0	0.0	41
0.0	0.0	0.0	0.0	0.0	0.0	0.0	40
[illegible]	0.0	0.0	0.0	0.0	0.0	0.0	39
[illegible]	0.0	0.0	0.0	0.0	0.0	0.0	38
0.0	0.0	0.0	0.0	0.0	0.0	0.0	37
[illegible]	0.0	0.0	0.0	0.0	0.0	0.0	36
[illegible]	0.0	0.0	0.0	0.0	0.0	0.0	35
0.0	0.0	0.0	0.0	0.0	0.0	0.0	34
0.0	0.0	0.0	0.0	0.0	0.0	0.0	33
0.0	0.0	0.0	0.0	0.0	0.0	0.0	32
0.0	0.0	0.0	0.0	0.0	0.0	0.0	31
0.0	0.0	0.0	0.0	0.0	0.0	0.0	30
0.	0.0	0.0	0.0	0.0	0.0	0.0	29
[illegible]	0.0	0.0	0.0	0.0	0.0	0.0	28
0.0	0.0	0.0	0.0	0.0	0.0	0.0	27
[illegible]	0.0	0.0	0.0	0.0	0.0	0.0	26
[illegible]	0.0	0.0	0.0	0.0	0.0	0.0	25
0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
[illegible]	0.0	0.0	0.0	0.0	0.0	0.0	23
0.	0.0	0.0	0.0	0.0	0.0	0.0	22
0.0	0.0	0.0	0.0	0.0	0.0	0.0	21
0.0	0.0	0.0	0.0	0.0	0.0	0.0	20
0.	0.0	0.0	0.0	0.0	0.0	0.0	19
0.0	0.0	0.0	0.0	0.0	0.0	0.0	18
0.0	0.0	0.0	0.0	0.0	0.0	0.0	17
0.	0.0	0.0	0.0	0.0	0.0	0.0	16
0.	0.0	0.0	0.0	0.0	0.0	0.0	15
0.0	0.0	0.0	0.0	0.0	0.0	0.0	14
0.0	0.0	0.0	0.0	0.0	0.0	0.0	13
0.0	0.0	0.0	0.0	0.0	0.0	0.0	12
0.0	0.0	0.0	0.0	0.0	0.0	0.0	11
0.0	0.0	0.0	0.0	0.0	0.0	0.0	10
0.	0.0	0.0	0.0	0.0	0.0	0.0	9
0.0	0.0	0.0	0.0	0.0	0.0	0.0	8
0.0	0.0	0.0	0.0	0.0	0.0	0.0	7
0.	0.0	0.0	0.0	0.0	0.0	0.0	6
0.	0.0	0.0	0.0	0.0	0.0	0.0	5
0.0	0.0	0.0	0.0	0.0	0.0	0.0	4
0.	0.0	0.0	0.0	0.0	0.0	0.0	3
0.	0.0	0.0	0.0	0.0	0.0	0.0	2
0.0	0.0	0.0	0.0	0.0	0.0	0.0	1
	110	111	112	113	114	115	

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